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**THE INSECT PEST SURVEY  
BULLETIN**

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**BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING**







# REPORTERS FOR THE INSECT PEST SURVEY

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## THE MORE IMPORTANT RECORDS FOR JANUARY AND FEBRUARY

The chinch bug came through the winter with but little mortality in Iowa and Nebraska.

Reports from the South Atlantic and East Central States indicate that the San Jose scale wintered with a very high survival.

A report from Indiana and one from Washington indicate that codling moth passed the winter with but little mortality in the East Central States and the Pacific Northwest.

The cabbage looper caused severe injury to cabbage in the Galveston, Tex., and Charleston, S. C., areas.

The diamond-back moth was generally prevalent and doing some damage in South Carolina and Texas.

The turnip aphid did much more damage than usual during February in the Gulf areas of Louisiana and Texas.

The common red spider was extremely abundant on strawberry plants in the Norfolk, Va., and Chadbourne, N. C., areas.

A very high percentage of loss was occasioned by the seed-corn maggot on spinach in the Charleston area of South Carolina. In attacking spinach this insect leaves the soil and infests the buds.

Late in October 1938 pink bollworm was found at Mesa, Ariz. This brings the Salt River Valley section back into the area known to be infested.

The spring cankerworm apparently overwintered with but low mortality in Illinois.



## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

Nebraska. M. H. Swenk (February 24): Egg population in general is about 15 percent less than a year ago, but conditions over the State are very spotted. Except for a few areas, eggs are reduced in southeastern, southwestern, and central Nebraska, but in the Panhandle region of western Nebraska they are markedly increased, owing to invasions of Melanoplus mexicanus Sauss. late last season. In northeastern Nebraska some counties show reductions, others show increases. The two-striped grasshopper (M. bivittatus Say) remains generally distributed over the State, the most concentrated population being in the eastern half, especially in the Platte and Elkhorn Valleys. The red-legged grasshopper (M. femur-rubrum Deg.) remains generally distributed in alfalfa fields over the State. The differential grasshopper (M. differentialis Thos.) increased in 1938 over 1937, especially in the lower Platte Valley and parts of northeastern Nebraska.

### WIREWORMS (Elateridae)

Nebraska. M. H. Swenk (February 24): Reports of wireworms (Melanotus sp.) received from Keyapaha County on February 8 and from Pawnee County on February 11.

California. M. W. Stone (February 20): Adult males of the sugar beet wireworm (Limonius californicus Mann.) began emerging in laboratory cages at Alhambra on January 23, and females began to emerge on January 27.

### EUROPEAN EARWIG (Forficula auricularia L.)

California. A. E. Michelbacher (February 25): Believed to be more abundant at Berkeley than during the last 2 years. Eggs found on January 1 and many young present now.

### WEEVILS (Curculionidae)

Georgia. T. L. Bissell (February 24): A few adult weevils have been more or less active at Experiment, central Georgia, as follows: Pachylobius sp. on February 20; Pissodes sp. on February 14; and Hypera sp. on February 13.

### A SCARABAEID (Aphodius distinctus Mull.)

Nebraska. M. H. Swenk (February 24): On November 8, 1938, numbers of this beetle in Thurston County caused inquiries as to its identity.

### MOTHS (Noctuidae)

Georgia. T. L. Bissell (February 24): One moth, Caenurgia crassiuscula Haw., was taken at a light at Griffin, central Georgia, on February 8, and several moths of Plathypena scabra F. were taken from February 9 to 15.

A SCALE (Odonaspis ruthae Kot.)

Georgia. P. M. Gilmer (February 1): Taken from breeding plats of Bermuda grass at Tifton. Found on stems approximately at ground level or just below. Damage not serious, although scales occur in considerable numbers on some stems. They seem to congregate about the nodes and especially under the small bracts. (Det. by H. Morrison.)

CEREAL AND FORAGE CROP INSECTS

WHEAT

CHINCH BUG (Blissus leucopterus Say)

Iowa. H. E. Jaques (February 24): Chinch bugs are coming through the winter without any large percentage of loss.

Nebraska. M. H. Swenk (February 24): The population is not threatening for 1939, except possibly in certain areas of Richardson and other counties in the extreme southeastern part of the State.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (February 28): Alfalfa fields in middle, low-land California surveyed on February 23 and 24. In northwestern San Joaquin Valley average number of larvae collected to 100 sweeps of the net ranged from 1 to 54 for different fields. Examination of alfalfa showed numerous small larvae feeding in growing tips. Feeding evident in certain locations without close observation. Adults of Bathyplectes curculionis Thoms. present throughout the region. At Pleasanton no weevil larvae nor adults collected but Bathyplectes adults observed. In the region adjacent to San Francisco Bay average number of larvae collected for different fields ranged from 0 to 27. Number of dead larvae observed; cause of death undetermined whether owing to attack by fungus or to drying from abrupt changes in temperature. Bathyplectes adults abundant.

FRUIT INSECTS

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (January 20): Infestation on peach trees at Fort Valley, central Georgia, still greater than that of an average year. Temperatures have not been sufficiently low to cause any mortality and a high percentage of the scales are alive in unsprayed orchards. (February 17): Still no mortality of San Jose scale, causing a greater infestation than average at Fort Valley.



Ohio. E. W. Mendenhall (March 2): In certain localities this scale has wintered well and there may be an increase in numbers. Slight damage to fruits and ornamentals.

Illinois. W. P. Flint (February 27): San Jose scale has overwintered in southern Illinois with about 70-percent survival, which is unusually high.

BLACK-HORNED TREE CRICKET (Oecanthus nigricornis Walk.)

Michigan. E. I. McDaniel (February 14): Eggs collected in the 1938 growth of apple. This species seems quite abundant in Michigan.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Indiana. L. F. Steiner (March 2): Examinations indicate mortality of overwintering larvae as approximately 20 percent at Vincennes. Larval abundance somewhat less than normal. Development normal.

Washington. M. A. Yothers and E. J. Newcomer (February 27): Probably very little mortality in the Yakima Valley owing to mild winter. Season about normal.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

Florida. J. R. Watson (March 1): By the middle of February the tent caterpillars had hatched and were forming their nests, especially on the wild plums.

ROSY APPLE APHID (Anuraphis roseus Baker)

New Jersey. E. P. Felt (February 21): Apple twigs showing numerous eggs of presumably the rosy aphid received from Orange.

PEACH

PEACH BORER (Conopia exitiosa Say)

Ohio. E. W. Mendenhall. (February 20): Slightly infesting peach trees in nurseries and orchards.

PLUM

LEAF CRUMPLER (Mineola indigenella Zell.)

Texas. R. K. Fletcher (February 24): Reported on plum at Houston, Harris County.

YOUNGBERRY

RED-NECKED CANE BORER (Agrilus ruficollis F.)

Virginia. C. R. Willey (February 27): A quarter-acre patch of youngberries were observed on February 18 to be heavily infested and badly damaged.

PECAN

PECAN WEEVIL (Curculio caryae Horn)

South Carolina and Georgia. T. L. Bissell (February 24): Infestations in the 1938 crop at Fort Mill, York County, S. C., and in Lamar, Pike, and Sumter Counties, Ga. Injury apparently moderate.

PECAN CARPENTER WORM (Cossula magnifica Stkr.)

Georgia. T. L. Bissell (February 24): Pecan trees at Monroe, central Georgia, observed to be infested on February 20.

OBSURE SCALE (Chrysomphalus obscurus Const.)

Georgia. T. L. Bissell (February 24): Ten-acre orchard of pecan trees at Meansville, central Georgia, infested on January 23. Unusual to find pecans in Georgia infested.

CITRUS

FLOWER THRIPS (Frankliniella tritici Fitch)

Florida. M. R. Osburn (February 28): Numerous in open citrus blossoms.

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (March 1): Rather few in numbers, owing to dry weather of the winter that prevented much new growth on citrus.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Florida. M. R. Osburn (February 28): Winter mortality low and many in egg stage at present.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (March 1): Prevalent as the result of warm and dry weather in the middle of February in the Citrus Belt.

M. R. Osburn (February 28): Citrus rust mites numerous and late fruit being russeted where control measures are not applied.

ALMOND

CLOVER MITE (Bryobia praetiosa Koch)

California. H. J. Ryan (February 9): Almond mite reported on almond at Glendale, Los Angeles County, on January 17.



TRUCK - CROP INSECTS

PEPPER MAGGOT (Zonosemata electa Say)

Georgia. T. L. Bissell (February 24): Found common in fruits of horsenettle (Solanum carolinense), collected in September and October 1938 at Experiment and Milner, central Georgia. Never noted in pimiento peppers, which are grown extensively in this region.

A MAGGOT (Hylemya sp.)

Alabama. J. M. Robinson (February 24): Cabbage maggot reported as attacking onions and cabbage at Newville, Henry County, on January 13, and at Billingsley, Autauga County, on February 20.

MOLE CRICKETS (Scapteriscus spp.)

Florida. J. R. Watson (March 1): About the usual amount of damage by the southern mole cricket (S. acletus R. & H.) has been observed.

F. S. Chamberlin (February 15): Mole crickets are active in the tobacco plant beds in Gadsden County, necessitating control in many instances.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. H. G. Walker and L. D. Anderson (March 3): Active on warm days throughout the winter in the vicinity of Norfolk.

TOMATO AND POTATO

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. A. F. Howland (January 31): Found as leaf folders on small producing plants in several fields in the Niland section of Imperial County. In part of one field there were from four to six leaf folders per plant. No injury to fruit observed upon examination.

A PLANT BUG (Miridae)

Georgia. T. L. Bissell (February 24): Tomato plants in a greenhouse at Experiment, central Georgia, infested and stunted by an undetermined small green mirid on February 18.

POTATO APHID (Macrosiphum solanifolii Ashm.)

Delaware. M. D. Leonard (March 2): A light infestation developing on a number of greenhouse tomato plants at Wilmington.

POTATO PSYLLID (Paratrioza cockerelli Sulc.)

North Dakota. J. A. Munro (March 4): Infestation in a Fargo greenhouse, found in December 1938, has been eradicated.

Montana. H. B. Mills (February 21): Found to be abundant on potatoes and Jerusalem-cherries in greenhouses in Bozeman about the middle of February.

Nebraska. M. H. Swenk (February 24): Reported as hibernating abundantly on juniper trees and found in all stages on potted ornamental pepper plants in greenhouses in western Nebraska.

### BEANS

#### BEAN APHID (Aphis rumicis L.)

Delaware. M. D. Leonard (March 2): Light infestation on bean plants in a greenhouse at Wilmington.

California. H. J. Ryan (February 9): Reported on rhubarb at Pico and Rivera, Los Angeles County, on January 6. Heavy infestation. (Det. by E. O. Essig)

### CABBAGE

#### CABBAGE LOOPER (Autographa brassicae Riley)

South Carolina. W. J. Reid, Jr. and C. O. Bare (January 31): Apparently somewhat more abundant than usual for this time of year at Charleston, probably owing to mild weather the last few weeks. Looper was next in abundance to the diamondback moth (Plutella maculipennis Curt.) on a midwinter cabbage planting. Damage moderate.

Texas. M. J. Janes (February 24): Present in Galveston County all winter. On January 5 it was causing severe injury to cabbage, from 6 to 10 or more larvae per head being found on mature plants.

#### DIAMONDBACK MOTH (Plutella maculipennis Curt.)

South Carolina. W. J. Reid, Jr., and C. O. Bare (January 31): Larvae apparently more abundant than usual for this time of year, owing to mild weather. This species the most abundant insect on a midwinter cabbage planting at Charleston. All stages present. Damage moderate. If mild temperatures continue, there are possibilities of more than the usual amount of damage to the spring crop.

Texas. M. J. Janes (February 24): Reported on January 6 as injuring cabbage in Fort Bend and Galveston Counties, the first time damage was recorded in these areas this winter.

#### GREEN PEACH APHID (Myzus persicae Sulz.)

Delaware. M. D. Leonard (March 2): A light infestation on greenhouse cabbage plants at Wilmington.

#### HARLEQUIN BUG (Murgantia histrionica Hahn)

California. A. E. Michelbacher (February 28): Found hibernating during January as nymphs and adults.



SQUASH

SQUASH BUG (Anasa tristis Deg.)

Iowa. H. E. Jaques (February 24): Squash bugs are coming through the winter without any large percentage of loss.

TURNIP

TURN APHID (Rhopalosiphum pseudobrassicae Davis)

Louisiana. P. K. Harrison (February 13): Mustard, turnip, and radish reported as attacked at Thibodaux, New Iberia, and Baton Rouge. Thirty acres of mustard destroyed at New Iberia and 50 acres of radishes at Thibodaux.

Texas. M. J. Janes (February 24): More damage than usual caused in Galveston County, owing to the warm winter.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Maryland. F. Andre (February 11): Observed infesting and injuring carnation blooms in a greenhouse at Raspeburg.

Florida. J. R. Watson (March 1): In the vicinity of Sanford there is a rather heavy infestation of onion thrips on celery.

Texas. R. K. Fletcher (February 24): Reported as increasing on onions at Crystal City, Zavala County.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (March 1): Late in December the pepper weevil became very abundant in one field in Manatee County, destroying practically the entire crop.

STRAWBERRY

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker and L. D. Anderson (March 3): Reported as rather abundant in strawberry fields in the Norfolk area.

North Carolina. W. A. Thomas (February 25): Present in injurious numbers on some strawberry farms in the Chadbourn area. Some plants have made little growth and are even dropping leaves as result of injury. Apparently unusual for such activity so early in the spring, especially in view of wet weather during this period.

FIELD CRICKET (Gryllus assimilis F.)

North Carolina. W. A. Thomas (February 20): Unusually abundant in the strawberry fields in the vicinity of Chadbourn. Some injury already noticed, and present population indicates possibility of serious damage when fruit begins to form.

STRAWBERRY PAMERA (Pamera longulus Dall.)

Florida. J. R. Watson (March 1): Some complaints received of damage in the Plant City section.

SPINACH

SEED-CORN MAGGOT (Hylemya cilicrura Rond.)

South Carolina. W. J. Reid, Jr. (January 20): Approximately 25 percent of the plants of a 2<sup>1</sup>/<sub>2</sub>-acre planting of spinach at Charleston infested. Specimens of affected plants indicated that buds were being rather severely injured. This habit of the seed-corn maggot in leaving its usual habitat in the soil to attack the buds of spinach has been reported from Texas but had not previously been known by the writer to cause such injury in the Charleston area.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas fornicarius F.)

Mexico. K. L. Cockerham (February 23): Four larvae collected in Monterey, Nuevo Leon, Mexico, on December 31, 1938. Specimens taken from sweet-potatoes on the public market.

BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Texas. S. E. Jones (February 24): A few females collected from table beets and spinach in the Winter Garden area at Winter Haven, Dimmit County. Curly-top present on both plants.

SUGAR-BEET ROOT APHID (Pomphigus betae Doane)

Nobbraska. M. H. Swenk (February 24): Specimens taken from piles of sugar beets at the factory sent in from Hall County on December 19, 1938.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

Florida. C. S. Rude and L. C. Fife (February 4): Many weevils observed in old cotton bolls on plants in the fields of sea island cotton in Florida. When bolls are broken open weevils are active and apparently not in condition to hibernate. Examinations of surface trash in and around cotton fields show



few weevils in hibernation in this material. (February 11): Some weevils taken from surface trash around cotton fields, but much more abundant in bolls in the fields.

Louisiana. R. C. Gaines and assistants (February 4): One boll weevil taken on the leeward side of the revolving screen at Tallulah, Madison Parish, for the week ended February 3. No weevils collected during the same period in 1937 or 1938.

Texas. R. W. Moreland (January 28): A few weevils found out of hibernation during the last week in Brazos County, and on several days some of the weevils were active. (February 4): Some weevil activity noticed in hibernation cages on January 30 and 31. (February 18): Weevils found out of hibernation in 31 out of 50 cages on February 14. Total number observed was 56.

#### PINK BOLLWORM (Pectinophora gossypiella Saund.)

Arizona. R. E. McDonald (October 31): Most important finding of the week was one specimen taken at Mesa on October 27, 1938. This brings the Salt River Valley section back into the areas known to be infested. (November 7, 1938): It is significant that the infestation in the Salt River Valley is showing up in exactly the same spot where it was discovered in 1929. No pink bollworms taken in other parts of the valley.

#### COTTON STAINER (Dysdercus suturellus H. S.)

Florida. J. R. Watson (March 1): Less noticeable than last year on Urena lobata in the Melbourne area. Reported by P. W. Calhoun.

C. S. Rude and L. C. Fife (February 4): Many nymphs and adults observed on old bolls on cotton plants in the fields of sea island cotton. Insects feeding on seeds in bolls. (February 11): In many places the cotton stainer is wintering in both mature and immature stages in old bolls on cotton stalks. There has not been enough cold weather to kill them.

#### A TARNISHED PLANT BUG (Lygaeus pratensis oblineatus Say)

Louisiana. R. C. Gaines and assistants (February 25): During the week ended February 24, 27 tarnished plant bugs were taken on field flight screens in Madison Parish; 20 on stationary screens; and 7 on the leeward side of revolving screens.

#### F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

#### SPRING CANKERWORM (Paleacrita vernata Peck)

Illinois. W. P. Flint (February 27): Pupae have apparently overwintered in good shape. Rather a serious infestation expected over the northern three-fourths of the State.

Iowa. H. E. Jaques (February 24): No moths observed in flight nor any females near bands on trees. Relatively small amount of digging done for pupae has revealed a very limited number.

FALL CANKER WORM (Alsophila pometaria Harr.)

Kansas. H. R. Bryson (March 1): Some trapped on bands on elm trees early in February.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (February 24): Inquiries as to control against attack on American and Chinese elms, hackberry, and other trees received from Cheyenne, Bowd, Clay, and Saline Counties during the period from October 21, 1933 to February 20, 1939.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Ohio. E. W. Mendenhall (February 20): Arborvitae, Norway maple, and other shade trees in and south of Columbus infested. Quite numerous and doing some damage last year. Cocoons found to have wintered in good shape.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Connecticut. E. P. Felt (February 21): Obviously in abundance on several butternut trees in Fairfield County.

Ohio. E. W. Mendenhall (March 2): Abundant on lilacs, cornus, and some other ornamentals. Possibility of bad infestations, as winter has been mild and scale has come through in good shape.

California. H. L. McKenzie (February 17): Serious infestation observed on Ceanothus sp. near the Bureau of Entomology laboratory at Berkeley. Scale so numerous that many of the bushes were being killed outright.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

North Carolina. Z. P. Metcalf (February 17): Reported as attacking Chinese elm at Raleigh.

LARGER ELM LEAF BEETLE (Monocesta coryli Say)

Virginia. H. G. Walker and L. D. Anderson (March 3): Larvae found hibernating in large numbers about an inch below the surface of the ground under elm trees near Norfolk.

A FLEA BEETLE (Altica ulmi Woods)

Connecticut. M. P. Zappe (February 25): Large numbers of hibernating adults seen and several lots sent in for identification. Adults hibernate around bases of elm trees.



EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Nebraska. M. H. Swenk (February 24): Infestation in Lincoln County reported on January 26.

LOCUST

LOCUST BORER (Cyrtene robiniae Forst.)

Nebraska. M. H. Swenk (February 24): Black locust trees in Adams County reported on February 1 as being damaged.

A BORER (Agilus difficilis Gory)

Nebraska. M. H. Swenk (February 24): A honey locust tree in Adams County reported on February 1 as being attacked.

NORWAY MAPLE APHID (Periphyllus lyropictus Kess.)

Connecticut. E. P. Felt (February 21): Eggs found in abundance on Norway maple in the Stamford area.

OAK

CARPENTER WORM (Prionoxystus robiniae Peck)

Nebraska. M. H. Swenk (February 24): Reported on November 15, 1938, as attacking young oak trees in Lancaster County.

A GALL-WASP (Andricus topiarius Ashm.)

Nebraska. M. H. Swenk (February 24): Damaged oak buds received from Saline County late in November 1938.

PINE

A SCALE (Matsucoccus sp.)

California. H. L. McKenzie (February): What appears to be an undescribed species has been found apparently associated with a tip killing of lateral branches on ponderosa pine near Mt. St. Helena, Napa County. Mature pines show conspicuous flagging of branches.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Connecticut. E. P. Felt (February 21): Reported as increasing in southwestern Connecticut during the last few years.

WILLOW

POPLAR AND WILLOW BORER (Sternochetus lapathi L.)

Oregon. D. C. Mote (February 22): Young larvae common in willows in Portland and vicinity.

A SCALE (Chionaspis ortholobis Comst.)

California. H. J. Ryan (February 9): Reported on willow in Los Angeles County on January 17. (Det. by V. E. Williams.)

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

BULB MITE (Rhizoglyphus hyacinthi Bdv.)

Washington. E. J. Newcomer (February 27): Reported as more numerous than usual on Easter lilies in a greenhouse at Yakima.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Nebraska. M. H. Swenk (February 24): Reported as attacking house and greenhouse plants in 1938 in Douglas, Kearney, and Sheridan Counties on November 4, December 7, and December 30, respectively.

JAPANESE MAPLE SCALE (Leucaspis japonica Chll.)

Pennsylvania and Delaware. E. P. Felt (February 21): Specimens received from Philadelphia, Pa., recently. Twigs of privet covered with the scale and a number of tips dead. Infestation reported from Wilmington, Del.

SOWBUGS (Oniscidae)

Michigan. E. I. McDaniel (February 7): Reported as doing considerable damage to celery and tomato plants under glass at Zeeland. This complaint more or less frequent from greenhouses at this time of year.

Ohio. E. W. Mendenhall (February 27): Found in most greenhouses and damaging some plants. Control measures used.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujaefilina Del G.)

Virginia. C. R. Willey (February 27): Apparently a general infestation in the Richmond area this winter and spring on various oriental types of arborvitae, particularly the compact varieties. It is possible that it may be as bad as several years ago, when it was very destructive, especially to the compact "golden" oriental types.



AZALEA

AZALEA LEAF MINER (Gracilaria azaleella Brants.)

Oregon. D. C. Mote (February 22): Common in young larval stage and injuring azaleas in nurseries at Portland.

CAMELLIA

CAMELLIA SCALE (Lepidosaphes camelliae Hoke)

Georgia. T. L. Bissell (February 24): Reported as heavy on camellia at Griffin, central Georgia, on February 20.

CHRYSANTHEMUM

CHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea Loew)

Ohio. E. W. Mendenhall (February 20): General on chrysanthemums in greenhouses in Ohio.

FERN

FERN SCALE (Pinnaspis aspidistrae Sien.)

Texas. R. K. Fletcher (February 24): Specimens sent in from Robstown, Nueces County.

GERANIUM

CORN EAR WORM (Heliothis obsoleta F.)

Ohio. E. W. Mendenhall (February 24): Numerous and causing some damage to geranium plants in a greenhouse in Columbus.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (March 1): In the large plantations in Manatee and Lee Counties this pest became abundant in December and is gradually increasing in numbers.

Ohio. E. W. Mendenhall (February 27): Some found in greenhouses and in storage, attacking gladiolus and amaryllis, doing considerable damage.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicis Curt.)

Virginia. H. G. Walker and L. D. Anderson (March 3): Apparently unusually prevalent this spring in the vicinity of Norfolk.

IVY

OLEANDER SCALE (Aspidiotus hederæ Vallot)

Ohio. E. W. Mendenhall (February 20): Frequently abundant in greenhouses on ivy.

JUNIPER

A MITE (Paratetranychus sp.)

Oregon. D. C. Mote (February 22): Overwintering eggs present in large numbers on thuja and juniper at Portland.

LILY

A THrips (Liothrips vaneeckei Priesn.)

California. E. O. Essig (January 24): A new record for this thrips is at Berkeley on September 20, 1933, on Lilium pardalinum.

OLEANDER

POLKA DOT WASP MOTH (Syntomeida epilais Walk.)

Florida. J. R. Watson (March 1): The polka dot wasp moths were flying all through the winter but so far the larvae have done very little damage to the oleanders.

ROSE

ROSE APHID (Macrosiphum rosæ L.)

Delaware. M. D. Leonard (March 2): A light infestation on rose plants in a greenhouse at Wilmington.

Virginia. C. E. Willey (February 27): Present for several weeks in the Richmond area. Adults and many young found on roses examined on February 20.

TULIP

FICKLE MIDGE (Sciara inconstans F.)

Georgia. O. I. Snapp (February 7): Very abundant in a greenhouse at Fort Valley. Larvae especially attacking tulip bulbs, and adults a nuisance.



INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

BOXELDER BUG (Leptocoris trivittatus Say)

Virginia. C. R. Willey (February 27): Observed at various places over the State all winter. Large numbers of specimens submitted during the last 2 weeks.

West Virginia. L. M. Peairs (January 11): Described as being very numerous at Moorefield, Hardy County. A few specimens collected near Morgantown or in Ohio County, but this seems to be a larger number than seen here and may be an extension of the recorded range.

Iowa. H. E. Jaques (February 24): Observed as coming through the winter without much loss.

Nebraska. M. H. Swenk (February 24): Complaints of annoyance received from Madison, Polk, York, Cuming, Pawnee, Cass, and Douglas Counties from October 21, 1938, to February 20, 1939.

Kansas. H. R. Bryson (March 1): More bugs went into hibernation in the fall of 1938 than had been seen for 3 or 4 years.

Utah. G. F. Knowlton (February 20): Abundant this winter in numerous localities, invading buildings and causing considerable annoyance.

Washington. R. D. Shenefelt (February 24): Unusual numbers observed in a house at Colfax.

BEDBUG (Cimex lectularius L.)

Nebraska. M. H. Swenk (February 24): Inquiries as to control in poultry houses and dwellings received from Dawes, Redwillow, Thayer, and Burt Counties from October 21, 1938, to February 20, 1939.

DOG FLEA (Ctenocephalides canis Curt.)

Nebraska. M. H. Swenk (February 24): A house in Douglas County reported on December 7 as being infested.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. M. M. Cole (February 27): Active in the nymphal stage throughout the winter on Martha's Vineyard. A few specimens taken each month on meadow mice, although the last adults were taken on October 10, and the last larvae on December 9, 1938. Adults and nymphs were found hibernating in meadow-mouse nests.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Virginia. H. G. Walker and L. D. Anderson (March 3): Reported as continually attacking a dog at Norfolk.

Nebraska. M. H. Swenk (February 24): Specimens taken from a dog were sent in from Douglas County on November 9.

POULTRY

SMALL BODY HEN LOUSE (Menopon pallidum Nitz.)

Nebraska. M. H. Swenk (February 24): Prevalent on chickens in Keyapaha County on December 22, 1938.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

New York, District of Columbia, and Virginia. R. A. St. George (February 6): Winged adults of R. flavipes Koll. in flight in heated buildings at Malverne, Long Island, N. Y., Washington, D. C., and Arlington, Va. Flight from 2 to 3 weeks earlier than usual.

Connecticut. N. Turner (February 23): Judging from specimens sent in, the flight season of R. flavipes started later than last year.

North Carolina. B. H. Wilford (February 20): First flight of year of R. flavipes in the locality of Asheville.

Florida. J. R. Watson (March 1): By the middle of February considerable swarming of the subterranean termites (R. flavipes) observed near Gainesville.

Nebraska. M. H. Swenk (February 24): Damage by R. tibialis Banks reported from Douglas, Gage, and Franklin Counties during the period from October 21, 1938, to February 20, 1939.

Oklahoma. C. F. Stiles (March 4): First reports of termites swarming were on February 15 at Ada, winged forms collecting in a store window.

Idaho. R. A. St. George (February 4): Adults of R. tibialis observed in flight in heated house at Twin Falls.

ANTS (Formicidae)

Nebraska. M. H. Swenk (February 24): An abundance of the cornfield ant (Lasius niger alienus americanus Emery) caused inquiries as to control from Hayes County on October 24, 1938, and from Franklin County on January 21. Specimens of basement ant (L. interjectus Mayr) received from Douglas County on January 10.



Texas. R. K. Fletcher (February 24): Pharoah's ant (Monomorium pharaonis L.) reported at Crosby, Harris County.

FIELD CRICKET (Gryllus assimilis F.)

Nebraska. M. H. Swenk (February 24): Reported as infesting a house in Colfax County on December 19.

COMMON POWDER-POST BEETLE (Lyctus planicollis Lec.)

Illinois. C. L. Metcalf (January 18): Unusual number of complaints received from northern Illinois. Apparently adults are emerging earlier than usual, probably owing to mild winter weather.

BEAN WEEVIL (Acanthoscelides obtectus Say)

Maine. F. H. Lathrop (March 1): Reports of injury to stored beans by weevils have been more numerous than usual during the winter months.

PEA WEEVIL (Bruchus pisorum L.)

Montana. H. B. Mills (February 21): Specimens submitted from Glendive, on the eastern border near the central part of the State, where it has been attacking stored peas, apparently all from one local garden.

BEETLES (Coleoptera)

Georgia. T. L. Bissell (February 24): Mealworms, determined tentatively as Tenebrio obscurus F., very abundant in a corn-grinding mill at Zebulon, central Georgia, on February 22.

Nebraska. M. H. Swenk (February 24): Reports of injury to wheat, corn, and seeds in storage received during the period from October 31, 1938, to January 15, 1939, from Box Butte, Cheyenne, Custer, Harlan, Sherman, Merrick, and Burt Counties. One of species chiefly concerned was the saw-toothed grain beetle (Oryzaephilus surinamensis L.) in small grains and seeds. Cadelle (Tenebroides mauritanicus L.) found infesting stored wheat in Saline and Polk Counties in November 1938. Confused flour beetle (Tribolium confusum Duv.) reported as infesting flour bins in Hall and Saline Counties on December 16, 1938, and January 10, 1939, respectively. Carpet beetle (Anthrenus scrophulariae L.), living in newspaper insulation in Douglas County, reported on January 24. Larvae of buffalo moth (A. verbasci L.) found in rayon and silk in Pawnee County. Larvae of black carpet beetle (Attagenus piceus Oliv.) received from Garden County on November 19, 1938, and from Douglas County on January 24, the latter living in newspaper insulation. Cigarette beetle (Lasioderma serricorne F.), taken from upholstered furniture in Douglas County on January 9, found to be parasitized by Cephalanomia gallicola Ashm. (Parasite det. by C. F. W. Muesebeck.)

Utah. G. F. Knowlton (January 10): Stock feed, received at Wellsville, infested with confused flour beetle.

A FUNGUS BEETLE (Mycetophagus flexuosus Say)

Nebraska. M. H. Swenk (February 24): Specimens found in a house in Pierce County submitted on December 14, 1938.

ANGOUMOIS GRAIN MOTH (Sitotroga cerealella Oliv.)

Nebraska. M. H. Swenk (February 24): Reported as infesting corn in Box Butte, Cheyenne, Custer, Harlan, Sherman, Merrick, and Burt Counties during the period from October 31, 1938, to January 15, 1939.

BOOKLOUSE (Troctes divinatorius Mull.)

Maine. J. H. Hawkins (February 20): Specimens taken from duck-growing pellets at Auburn and Scarborough. (Det. by A. B. Gurney.) (March 1): Now generally present in feed samples stored in the basement of the experiment station building at Orono.



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## INSECT PEST SURVEY BULLETIN

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COLONIZATION OF JAPANESE BEETLE PARASITES IN THE  
EASTERN STATES IN 1938

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In 1937 a summary report entitled, "Liberations of Japanese Beetle Parasites in the Eastern States in 1937," was published in the Insect Pest Survey Bulletin (Vol. 17, Supp. to No. 9, pp. 473-482). In that report the early colonization of the more important established parasites, from the first colonization to the close of 1937, was given in tabular form. The purpose of the present report is to continue the colonization record of the established parasites to date and to give additional notes on species receiving little or no attention in the former report.

There are at present considered as established three dipterous species and two species and two racial forms of hymenopterous parasites. The status of the species and strains is as follows:

Dexia ventralis Ald.--Since the initial colonization of this parasite in 1926, through the year 1938, a total of 15,254 individual parasites have been released in varying numbers in 14 colonies, distributed in 5 States as follows: New Jersey, 3; Pennsylvania, 5; Illinois, 4; Maryland, 1; and Long Island, N. Y., 1. All of the colonies liberated prior to 1938 have been scouted for recovery from time to time, but only 1, at Haddonfield, N. J., has been recovered. This colony has served as a source of material for several years. One colony was released in Chester County, Pa., in 1938. This parasite has 3 broods annually, but it is hindered in its development and increase because of the scarcity of Japanese beetle host larvae during the flight period of the second brood of Dexia females. The general scarcity of native scarabaeid larvae, which might serve as alternate hosts during this period, also is a factor affecting the build-up of this parasite in the area where it is now established. The only way of augmenting the use of this parasite would seem to be placing it in new areas where Popillia occur in conjunction with Phyllophaga, the latter serving as an alternate host during the time the second brood of Dexia females are larvipositing. In its natural spread to the southward the Japanese beetle seems to be entering an area where several species of Phyllophaga are more abundant, thus in view of a possibility of finding new and satisfactory areas for future liberations of Dexia ventralis, a nucleus of reared material is now being held for future experimental colonization of this species. At present D. ventralis is of little economic importance.

1/The writer acknowledges the assistance of his associates, L. B. Parker, I. M. Hawley, and J. W. Balock, who were actively engaged in the many phases of work associated with the rearing, collecting, and distribution of parasites.

Prosenia siberita F.--This parasite of Japanese beetle larvae has been released in numbers totaling 12,364 individuals, distributed in varying numbers in 5 colonies between 1923 and 1930. Only 1 colony in the Moorestown, N. J., area is known to be established. No recent colonization of this species has been undertaken. The species does not increase in sufficient numbers to be of economic importance. The inability of Prosenia to increase its numbers is due largely to the fact that its adult stage is numerous during the flight period of its host, consequently the scarcity of beetle larvae at this time is unfavorable. In Japan this parasite is most numerous in areas where Popillia has a partial 2-year life cycle, but so far within the area now occupied by the beetle in the United States, the occurrence of a 2-year cycle is rare and so localized as to be of little benefit in increasing the numbers of this parasite.

Centeter cinerea Ald.--This Japanese fly is a parasite of the adult stage of the Japanese beetle. It has been extensively introduced and from 1922 through 1938 more than 70,000 flies have been liberated in varying numbers in 23 colonies, 13 of which have been recorded as established. One colony was liberated in 1938 in Washington, D. C. Surveys in 1936 indicate that the species has spread over 500 square miles in New Jersey and Pennsylvania. The species is not synchronized with the bulk of its host, generally appearing about 2 weeks too early. Release-ments at Keene, N. H., in 1936 were tests to determine whether in more northern areas proper synchronization would take place; however, limited observations at Keene in 1938 seem to indicate that there also the species is too early to meet the greatest number of beetles. Studies are now being started on this species in southern areas.

Table 1.--Colony distribution of Centeter cinerea

State	: Colonies : liberated : in 1922-38	: Colonies : recovered : in 1938
	: Number	: Number
Connecticut .....	3	2
New Jersey .....	5	4
Pennsylvania .....	13	7
New Hampshire .....	1	1
Washington, D. C. ....	1	0
Total .....	23	14

Tiphia vernalis Roh.--This is the most important parasite of the Japanese beetle. The species has been extensively colonized, the present total colonies numbering 1,127, of which 316 were placed in the field in the spring of 1938. All material now used for colonization purposes is field-collected from older colonies. Parasitization of Japanese beetle grubs by this species ranges from 10 to 60 per-cent, varying according to locality and abundance of host. In 1938 there were 300 colonies released in Maryland, distributed as follows: Cecil County, 179; Kent County, 40; Harford County, 39; Baltimore County, 38; Wicomico County, 2; Somerset County, 1; Worcester County, 1. This number was large enough to permit close placement of the colonies throughout the zone of intense beetle infestation, and also to colonize other areas sufficiently infested so as to reasonably assure establishment of the parasite. In addition, 15 colonies were released in Connecticut, in the following counties: Fairfield, 9; New Haven, 1; New London, 1; Windham, 1; and Hartford, 3. One large colony of 635 females was liberated at a very favorable spot



in Chester County, Pa. The present distribution of this parasite according to States is shown in table 2, and the accompanying map presents its distribution graphically.

Table 2.—Present distribution of *Tiphia vernalis*

State	Releases		Total colonies	
	Prior to 1938	In 1938	Released	Recovered
	Number	Number	Number	Number
Connecticut . . . . .	9	15	24	4
Delaware . . . . .	42	0	42	5
District of Columbia . . . . .	1	0	1	0
Maryland . . . . .	35	300	335	2
Massachusetts . . . . .	3	0	3	1
New Hampshire . . . . .	3	0	3	1
New Jersey . . . . .	289	0	289	75
New York . . . . .	12	0	12	1
Pennsylvania . . . . .	416	1	417	139
Rhode Island . . . . .	1	0	1	0
Total . . . . .	811	316	1,127	228

*Tiphia popilliavora* Roh.—The total number of colonies of this species is 676, of which 94 were liberated in 1938. All material now used in the colonization of this species is derived from older colonies. For the past few years this parasite has shown a decline in abundance within the older area of beetle infestation, which also has been marked by a reduction in beetle population. A slight increase in parasite abundance was noted in 1938; however, it is doubtful whether this will be evident in 1939, because of the generally poor condition of host larvae during the egg-laying period in 1938. Host grubs at this time were late in development and consisted of a predominance of second-instar larvae, which, if accepted by the parasite, will result in a high rate of mortality and a predominance of male *Tiphia* in 1939. The 94 liberations made in 1938 were distributed as follows: 64 colonies in Maryland, of which 34 were in Cecil County, 24 in Harford County, 2 in Kent County, and 1 each in Dorchester, Somerset, Washington, and Worcester Counties; 18 colonies in Connecticut, of which 11 were in Fairfield County, 2 in Hartford County, 3 in New Haven County, 1 in New London County, and 1 in Windham County; and in New York State, 12 colonies were liberated in Westchester County. Table 3 gives the present total distribution of the species according to States, and the map shows graphically the general distribution in States where large releasements have been made.

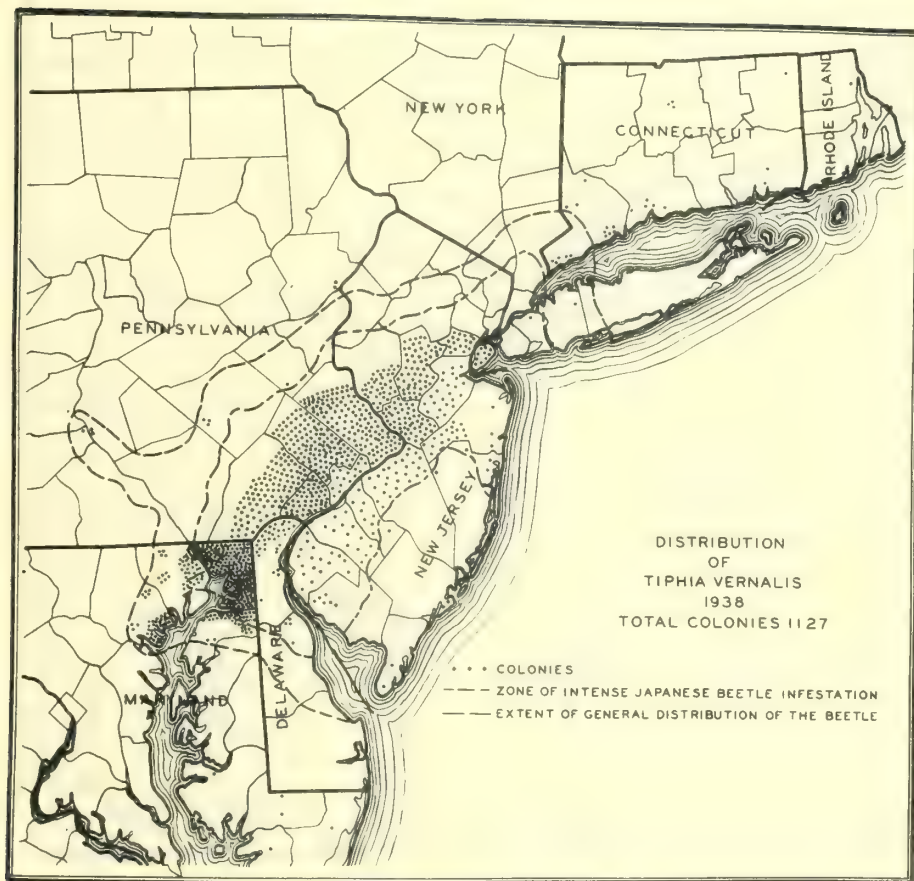


Table 3.--Present distribution of Tiphia popilliavora

State	Releases		Total colonies	
	Prior to	In 1938	Released	Recovered
	1938			
	Number	Number	Number	Number
Connecticut . . . . .	6	18	24	5
Delaware . . . . .	31	0	31	2
Maryland . . . . .	11	64	75	0
New Jersey . . . . .	223	0	223	56
New York . . . . .	3	12	15	0
Pennsylvania . . . . .	308	0	308	191
Total . . . . .	582	94	676	254

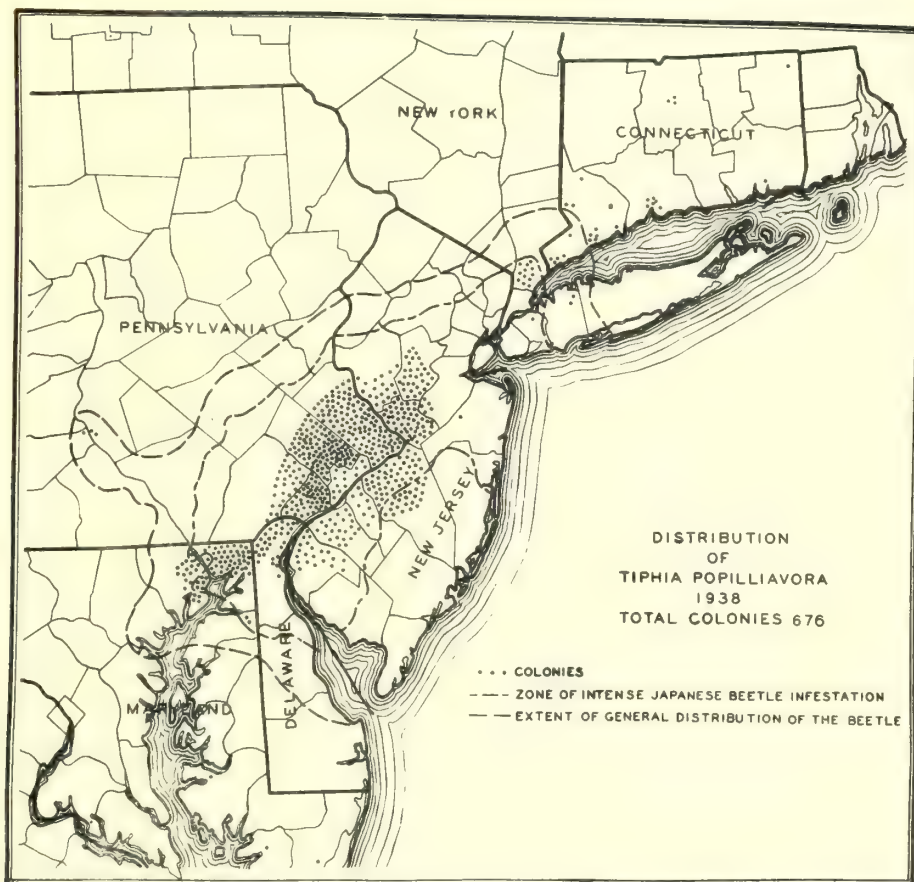
Tiphia popilliavora Roh. (Korean strain).---This racial form of the Japanese type is from Chosen (Korea). It has been more recently introduced and has been colonized in 37 different locations in 4 States, as follows: Delaware, 3; Maryland, 1; New Jersey, 13; and Pennsylvania, 20. Seven of the Pennsylvania colonies were placed in Chester County during the season of 1938. Limited scouting for recovery was conducted in 1938 and at present 6 colonies out of the 37 have been recovered.

Tiphia popilliavora Roh. (Chinese strain).---This is another late-season form of the type occurring in China. It was introduced with the hope of obtaining better synchronization of parasite and host. Between 1927 and 1929, 22 colonies, comprising 4,130 individuals, were released. One feebly established colony was recovered in 1929 and again in 1930. Its status will again be checked in 1939.











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## THE MORE IMPORTANT RECORDS FOR MARCH

Probably the most interesting development in the month of March was an outbreak of green bug infesting wheat in Oklahoma.

Mormon cricket eggs were hatching in Oregon during the second week in the month and in Washington during the third week.

Spring surveys indicate that there will be a heavy flight of May beetles in Kentucky this spring. During the last week in March numbers of these beetles were flying in Louisiana. Other States reporting large numbers of grubs are Kansas, Oklahoma, Texas, and Utah.

The sugar-beet wireworm was reported as heavily infesting potatoes in Los Angeles County and watermelon plantings in the San Joaquin Valley, Calif.

Chinch bug is sufficiently numerous in parts of western Indiana to produce moderately heavy infestations. High survival is also reported from Illinois, southeastern Iowa, and parts of Missouri.

The San Jose scale passed the winter, with but little mortality in Georgia, Illinois, and Missouri, and reports of damage were received from Mississippi and Oklahoma.

Codling moth larvae passed the winter successfully in New York, Kentucky, Illinois, and Missouri. In the Cornelia section of Georgia larvae were beginning to pupate during the third week in March.

Eggs of the fruit tree leaf roller are very numerous in western Illinois and eastern Missouri, with indications of heavy infestations this spring.

Aphid eggs are generally abundant on apple in Pennsylvania, Virginia, and Kentucky. Apple grain aphid was hatching early in the month in Kentucky, and rosy apple aphids were observed hatching during the fourth week in the month in Virginia.

Plum curculio began to appear on peach trees at Fort Valley, Ga., on March 6. The first adult of the season was seen at Experiment, Ga., on March 22, at Albany, Ga., March 23, and in Virginia on March 27.

The grape berry moth suffered but little mortality in the Lake grape belt of Ohio.

Unusually heavy infestations of tomatoes by the tomato pinworm occurred late in the month in Manatee County, Fla.

A weevil, Collabismodes cubae Beh., is heavily infesting tomato stems in Dade County, Fla., severely injuring the plants.

Tobacco moth was found overwintering in scrap tobacco spread on land last fall in North Carolina. This is the first record of the larvae of this insect overwintering out of doors.

Cankerworms are being reported generally over the East Central States, westward to Iowa and Nebraska. We have also received reports from Kansas and Oklahoma.



GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Florida. J. R. Watson (March 23): First eggs of the lubberly locust (Romalea microptera Beauv.) began hatching in Alachua County on March 14. Now mostly in the second instar and eggs still hatching.

Missouri. L. Haseman (March 10): A high percentage of eggs overwintering in good shape and in those counties where fall egg surveys showed high counts a heavy hatch is expected this summer.

MORMON CRICKET (Anabrus simplex Hald.)

Washington. R. A. Roberts (March 24): Mormon crickets hatching on March 21 at Pasco, Franklin County.

Oregon. R. A. Roberts (March 24): Mormon cricket hatching on March 10 at Warm Springs, Jefferson County.

EUROPEAN EARWIG (Forficula auricularia L.)

Washington. E. W. Jones (March 18): Overwintered adults began to emerge from soil at Walla Walla during the week ended on March 18.

WHITE GRUBS (Phyllophaga spp.)

Kentucky. W. A. Price (March 24): Surveys in the bluegrass region of Kentucky show that a heavy flight of May beetles will occur this spring. Principal species involved are P. hirticula Knoch, P. bipartita Horn, P. inversa Horn, P. fraterna Harr., P. futilis Lec., P. fusca Froel., and P. tristis F

Louisiana. C. O. Eddy (March 27): June beetles observed flying since about March 16 and in much greater numbers since March 24.

Kansas. H. R. Bryson (March 24): White grubs fairly abundant on March 22 and now working their way gradually to the surface of the ground.

Oklahoma. F. A. Fenton (March 24): The outbreak of wheat white grub (P. lanceolata Say) has apparently subsided; localized infestation being found only near Okeene, Blaine County.

Texas. M. J. Janes (March 24): Observed on February 17 as causing severe damage to strawberries planted on land broken from sod the previous season in Galveston County.

Utah. G. F. Knowlton (March 3): Sugar beet stands severely damaged by white grubs in several fields at Wellington, Carbon County, in 1938.

### WIREWORMS (Elateridae)

Kansas. H. R. Bryson (March 24): Aeolus dorsalis Say numerous in a wheatfield south of Junction City. This field has been in wheat year after year.

Washington. E. W. Jones (March 18): Early emergence of males of western field wireworm (Limonijs infuscatus Mots.) at Walla Walla on March 11.

California. M. W. Stone (March): In a 20-acre potato field near Artesia, Los Angeles County, an average of 6 sugar-beet wireworm larvae (L. californica Mann.) recovered per  $\frac{1}{4}$  square foot of row, and as many as 19 removed from a single seed piece. Damage in sugar beet plantings near Chino also reported.

A. F. Howland (March 17): Considerable damage to early watermelon plantings under hot caps at Kingsburg, Fresno County, by Limonijs sp. Adults very numerous. Usually necessary in this locality for growers to have to replant from one to six times because of damage.

### CUTWORMS (Noctuidae)

Kansas. H. R. Bryson (March 24): Little evidence up to March 22 to indicate cutworms as numerous. Recent searches for larvae revealed a scarcity of all species, a significant fact, considering that they were so abundant everywhere last spring.

### PLANTBUGS (Lygus spp.)

Utah. G. F. Knowlton and F. C. Harmston (March 24): L. elisus Van D. and L. elisus hesperus Knight active on warm days during the last 3 weeks.

### THRIPS (Thysanoptera)

District of Columbia. C. A. Weigel (November 10, 1938): Frankliniella tritici Fitch collected on outdoor roses in Washington. (Det. by F. Andre.)

Florida. J. R. Watson (March 23): Weather over most of State very dry, with the result that many insects characteristic of dry weather have become abundant. Particularly true of thrips. F. cephalica Crawford was scarce in the Gainesville section until about March 1, but since then it has multiplied rapidly. Extremely abundant on citrus bloom in Polk and other counties.

Louisiana. C. O. Eddy (March 27): Thrips, particularly F. tritici, observed in great numbers on onions, strawberries, shallots, and a number of other host plants. Less numerous during the winter than in recent years.

Utah. G. F. Knowlton (March 4): Some silvering of market pod peas in Iron, Piute, Garfield, Washington, Sevier, and Beaver Counties in 1938, in some cases resulting in reductions in grade.

## CRANE FLIES (Tipulidae)

- Kentucky. W. A. Price (March 24): Large part of a lawn in the vicinity of Paris ruined by an undetermined species of leather jacket. Grass on either side of the ornamental hedge and in spots at other places in the yard completely destroyed by March 16. Some injured spots from 10 to 15 feet in diameter.
- Louisiana. B. A. Osterberger (March 27): Very abundant in flight at Baton Rouge, East Baton Rouge Parish, on March 5.
- Missouri. A. C. Burrill (March 11): Groups of dancing midges observed several times throughout the winter on sunny days or after showers at Jefferson City. One such group was determined not as midges but as small tipulids. Altogether too small to represent the large leather jackets.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT AND OTHER SMALL GRAINS

#### CHINCH BUG (Blissus leucopterus Say)

- Indiana. C. Benton (March 18): Limited survey made from March 7 to 10 throughout south-central, southwestern, and western Indiana, indicates sufficient numbers present in parts of western Indiana to produce a spotted moderate-to-heavy infestation this spring, if weather conditions are favorable.
- Illinois. W. P. Flint (March 27): Examinations made late in March indicate a very high winter survival.
- Iowa. H. E. Jaques (March 22): Showing activity and apparently sufficiently abundant in southeastern Iowa to become a problem again this summer.
- Missouri. L. Haseman (March 10): Winter favorable for chinch bugs. Heavy winter counts spotted throughout the State, except in the northwestern, west-central, and southwestern parts, and some trouble expected next summer if spring and summer are dry. (March 22): Recent surveys in central Missouri indicate almost 100-percent winter survival.

#### GREEN BUG (Toxoptera graminum Rond.)

- Oklahoma. F. A. Fenton (March 24): Reported on wheat at Homestead, Blaine County, and on barley at Cleveland, Pawnee County.
- C. F. Stiles (March 26): Some damage being done in Payne and adjacent counties. Some fields badly damaged.
- Mexico. F. F. Cardenas (March 16): Wheat grown at Torreon, Coahuila, infested.



# APHIDS (Aphidae)

South Carolina. J. G. Watts (March 24): Small grains at Blackville damaged slightly by aphids.

## HESSIAN FLY (Phytophaga destructor Say)

Indiana and Illinois. C. Benton (March 18): Survey made of wheatfields in south-central, southwestern, and western Indiana and in adjacent counties in southeastern Illinois from March 7 to 10 to determine infestation by fall brood. Only a few seriously injured fields observed in the area, as was expected from the comparatively light summer infestation found in this area during the stubble survey last summer.

## FALSE WIREWORMS (Eleodes spp.)

Kansas. H. R. Bryson (March 24): Reported as abundant at Minneola on March 12.

Oklahoma. F. A. Fenton (March 24): Reported at Shattuck, Ellis County, on wheat.

## CORN

### SEED-CORN BEETLE (Agonoderus lecontei Chaud.)

Missouri. L. Haseman (March 22): Countless thousands observed in flight on the afternoon of March 22 at Columbia.

Kansas. H. R. Bryson (March 24): Flight observed on March 12. Report of large numbers in flight received from Lebo.

## ALFALFA

### ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (March 21): Survey conducted in infested area of lowland middle California on March 14 and 15. In the San Joaquin Valley average number of larvae collected to 100 sweeps of the insect net for different fields ranged from 1 to 623. In general larval population slightly greater than that a year ago. At Pleasanton no larvae or adults were collected, while in the region adjacent to San Francisco Bay larval count ranged from 0 to 43. Extent of parasitization by Bathyplectes curculionis Thoms. based on rearing records as follows: For San Joaquin Valley for February 23, 12.3 percent of last-stage larvae; in region adjacent to San Francisco Bay, 96.5 percent of last-instar larvae collected on February 24. Rearing records for recent survey not available, but it safe to say that parasitization about San Francisco Bay continues to be high.

### PEA APHID (Macrosiphum pisi Kltb.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Present but rather scarce in alfalfa fields at Norfolk. Very few collected on young peas on March 24.

Georgia. T. L. Bissell (March 22): None found on Austrian peas at Experiment, central Georgia.

Louisiana. C. O. Eddy (March 27): Arrival in numbers just observed, the first seen this year. Observed last year intermittently from November until late in spring.

Texas. R. K. Fletcher (March 22): What was believed to be pea aphid was observed on March 2 as seriously injuring English peas in San Saba County. Growers reported to have been unable to raise peas in the last several years.

#### BUGS (Hemiptera)

Arizona. W. A. Stevenson (March 11): The insect population remained low during the last week; however, several Hemiptera were collected on alfalfa and grain in Pima County. (March 25): Two individuals of Thyanta custator F. and one of Chlorochroa sayi Stal were taken on alfalfa at Sahuarita on March 22, and were the first pentatomids collected in the Santa Cruz Valley this season.

E. E. Russell (March 15): Owing to low temperatures in mid-November, pentatomids in Maricopa County were forced into winter quarters a month earlier than during the two preceding seasons. Examinations of hibernacula up to March 15 indicate the winter mortality rate to be 21.66 percent, approximately two-thirds greater than during either of the two preceding seasons, despite the fact that the common tachinid parasites Gymnosoma fuliginosa Desv. and Ocyptera euchenor Walk., are less prevalent than usual.

#### SOYBEAN

##### SILVER-SPOTTED SKIPPER (Epargyreus tityrus F.)

Maryland. T. L. Bissell (March 11): Pupae common in refuse in soybean field at Westover, southeastern Maryland, on December 25, 1938. (March 11): One adult just emerged.

#### KUDZU

##### CHAFF SCALE (Parlatoria pergandii Comst.)

Alabama. J. M. Robinson (March 24): Reported from Ozark on March 1 as attacking kudzu. First record of such infestation in Alabama.

#### SUGARCANE

##### SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. E. K. Bynum (March 20): Number of live stages found in burned cane trash in replicated overwintering experiments averaged 300 per acre, as compared with 255 in similar plots in 1938. First live pupa found in the field on February 9, as in 1938, and several additional pupae found during the next 10 days.

B. A. Osterberger. (March 27): First pupa for this spring found at Baton Rouge, on March 7. Adults began to appear on March 20.

SUGARCANE WEEVIL (Anacetrinus subnudus Buch.)

Louisiana. J. W. Ingram and L. J. Charpentier (March 20): Found in fair number in sugarcane stubble throughout southern Louisiana. In a variety test field of second-year stubble at Houna, an average of 13 percent of eyes, or buds, found to have been killed by larvae and an additional fairly high percentage killed by red rot, which had gained entrance through weevil tunnels.

FRUIT INSECTS

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Michigan. R. Hutson (March 28): Two or three rather heavy infestations on peach at Sodus and Eau Claire, in Berrien County. This is rather unusual, as no one around the institution has seen this scale on peach in many years.

Georgia. O. I. Snapp (March 20): Temperatures during the winter at Fort Valley central Georgia, not sufficiently low to kill scale. High percentage survived in unsprayed peach orchards. Infestation greater than that of an average year.

Mississippi. C. Lyle (March 24): Reports of injury received from Hinds, Lawrence, and Simpson Counties.

Illinois. W. P. Flint (March 27): Only about 30- to 35-percent winter mortality; a higher survival than normal.

Missouri. A. C. Burrill (December 11): Japanese pear trees are heavily infested at Jefferson City. Four attacked in 1936 and in 1938 two more suddenly attacked. Control measures have been used.

Oklahoma. F. A. Fenton (March 24): Found heavily infesting Photinia serrulata on March 7.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (March 20): Continued damage to shade and fruit trees, especially in counties along the southern border of the State, from February 21 to March 20.

Oklahoma. F. A. Fenton (March 23): Reported at Broken Arrow, Tulsa County, on redbud.

TWIG PRUNER (Hyperallus villosus F.)

Missouri. L. Haseman (March 22): Unusually abundant throughout most of Missouri during the last few years. Repetition of damage which occurred in apple orchards last year feared. In central Missouri sapsuckers removed most of the overwintering pupae from tunnels in twigs that did not fall to the ground.



Oklahoma. F. A. Fenton (March 24): Reported at Roff, Pontotoc County.

APPLE TWIG BORER (Schistoceros hamatus F.)

Kansas. H. R. Bryson (March 24): Reported from Lyons on March 18.

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

Oklahoma. F. A. Fenton (March 24): Reported at Jay, Delaware County, on apple.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Alabama. J. M. Robinson (March 24): Reported as attacking fruit trees at Jasper on March 21.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Pennsylvania. H. E. Hodgkiss (March 24): Eggs very abundant on apples and peaches in the eastern half of the State. Not so abundant in the counties west of State College.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (March 22): Winter temperatures at Poughkeepsie and vicinity moderate. Mortality of larvae low, only 12 percent of 219 larvae removed from burlap bands on trees on March 21 found dead. March temperatures lower than those of 1938. Present indications that spring moth emergence will begin nearer to normal and later than last year.

Michigan. R. Hutson (March 28): Codling moth seems to have come through the winter without undue mortality. Counts made at Paw Paw and Eau Claire indicate mortality of less than 10 percent.

Georgia. J. E. Webb, Jr. (March 23): Larvae just beginning to pupate in the Cornelia section.

Kentucky. W. A. Price (March 24): Winter mortality of larvae very low in orchards in both eastern and western Kentucky. Survival estimated at from 85 to 90 percent.

Illinois. W. P. Flint (March 27): Survival very high, although less than the normal number went into hibernation last fall.

Missouri. L. Haseman (March 10): Winter rather favorable for larvae. In breeding-cage studies at Columbia some of rearing sticks show rather high mortality, attributed largely to general condition of larvae when taken last fall, rather than to the winter. Despite the facts that most of the State had a very light apple crop and a reduced control program last summer, there is a fair carry-over throughout west-central, northern, and southeastern Missouri. Carry-over light throughout central and south-western Missouri, owing to absence of fruit last year.

H. Baker (March 27): Examination at Saint Joseph indicates mortality of overwintering larvae very light. No pupae found. Larval populations above average in apple orchards that produced a crop in 1938.

Washington. M. A. Yothers and E. J. Newcomer (March 18): First half of March in Yakima Valley coldest for 7 years, therefore control measures will begin later than was anticipated at the end of February.

FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

Illinois. W. P. Flint (March 27): Indications that there will be a heavy outbreak throughout the apple-growing section of western Illinois. In many orchards from 10 to 40 egg masses per tree can be found, averaging about 80 eggs per mass.

Missouri. L. Haseman (March 10): Eastern apple-growing areas of Missouri, extending from Cape Girardeau to Hannibal and west along the Missouri River from St. Louis to Jefferson City, show greatest egg-packet count since 1905, individual trees in some orchards showing as high as 100 packets per tree, with the average over the area probably not exceeding 10 per tree. Orchards in the rest of the State only lightly infested last year and egg packets difficult to find. Some trouble expected in practically all orchards in the State this summer. Control measures being used only in the eastern part.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

New Jersey. M. D. Leonard (March 25): Many wild cherry trees in the Haddonfield section examined for egg masses but these apparently present in only moderate numbers, although several trees about 8 to 10 feet high had from 10 to 15 egg rings each. No eggs hatched.

North Carolina. W. A. Thomas (March 15): Eggs have been hatching in Chadbourn area for several days and small nests are appearing in many wild cherry trees. Hatching began slightly in advance of the appearance of the first foliage.

C. S. Brimley (March 23): First web of year seen on wild cherry at Raleigh on March 26.

Georgia. A. L. Brody (March 10): Considerable annoyance reported by home owners, owing to entrance of caterpillars into houses. Reports on March 5 and 10 of migration from nests in crotches of cherry trees. Cherry trees still dormant.

Florida. S. O. Hill (March 23): Nests present on wild cherry and crab apple in the vicinity of Monticello on March 9.

Mississippi. C. Lyle (March 24): Hatching eggs on apple twigs received from Enid on March 6.



APHIDS (Aphidae)

Pennsylvania. H. E. Hodgkiss (March 24): Eggs abundant on apple trees. Reported as more abundant than usual.

Virginia. A. M. Woodside (March 27): Eggs of rosy apple aphid (Anuraphis roseus Baker) began hatching at Staunton on March 24.

Michigan. R. Hutson (March 26): Aphid eggs are unusually abundant everywhere in apple orchards.

Kentucky. W. A. Price (March 24): Many apple grain aphids (Rhopalosiphum prunifoliae Fitch) had hatched on March 8 and were found crawling over apple buds. Rosy aphid eggs extremely abundant in many apple orchards. Still too early for hatching to occur, so no estimate of winter mortality is possible.

Mississippi. C. Lyle (March 24): Specimens of woolly apple aphid (Eriosoma lanigerum Hausm.) received from Vicksburg in February.

Missouri. L. Hasenan (March 10): Despite a very severe infestation of rosy aphid over most of the State in 1938, overwintering eggs of aphids of all species on apple trees are extremely scarce. Probably fewer eggs throughout central Missouri this winter than for many years. (March 22): Recent rearings at Columbia show only apple-oat aphids (R. prunifoliae) on apple twigs forced in the laboratory.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Virginia. A. M. Woodside (March 27): Beetles observed beginning to enter peach orchards in the vicinity of Crozet today.

Georgia. O. I. Snapp (March 20): Adults began to appear on peach trees at Fort Valley, central Georgia, on March 6. Only 25 to 50 percent of fruit buds of Elberta trees were open when the first curculios were caught by jarring. Hiley peaches were from 50 to 75 percent in bloom and Early Rose just beginning to bloom when first curculios appeared from hibernation. By March 12, when Elbertas were in full bloom, curculios were appearing in numbers from hibernation, and by the time three-fourths of the petals had fallen (March 18) had reached the center of orchards in numbers, the first one arriving on March 16. Control measures were started in orchards of central Georgia by March 16. As the average was only 1.25 beetles for each jarring per tree, the general infestation is not believed to be heavier than that of an average year and examination of hibernating material during the winter may prove it to be lighter. Eggs had not started to form in bodies of females until March 11. Mature and immature eggs found in bodies of many females caught on March 15. Curculios still appearing from hibernation on March 18, although weather was cool and windy.



T. L. Bissell (March 22): One plum curculio jarred today from five tree at Experiment, central Georgia, the first insect of the season seen and the first jarring. First records of the season for last 4 years are as follows: March 25, 1935; April 6, 1936; April 26, 1937; March 24, 1938.

G. F. Moznette (March 23): First hibernating beetles caught today by jarring peach trees at Albany. Beetles might have appeared earlier except for prevailing cold weather the previous week, March 13 to 18. Beetles taken only on trees in outside rows, next to native growth.

J. E. Webb, Jr. (March 23): Fifteen peach trees in Elberta orchard in the Cornelia section were jarred on March 22 and 15 trees in another orchard on March 23, but no plum curculios were caught.

#### BEEILES (Coleoptera)

Georgia. O. I. Snapp (March 6): First adults of Pantomorus godmani Crotch of the season captured on peach trees at Fort Valley.

J. E. Webb, Jr. (March 23): Among insects jarred from 15 Elberta trees in the Cornelia section on March 22, and 15 other trees on March 23, were P. godmani, Diabrotica duodecimpunctata F., and several species of ladybird beetles.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Mississippi. C. Lyle (March 24): Injured peach twigs received from Jackson in December 1938 and from Columbia in January. Reports of injury received from Olive Branch in January and Van Vleet in February.

#### PEACH BORER (Conopia exitiosa Say)

Maryland. E. N. Cory (March 14): Attacking peach roots at Sykesville.

Georgia. C. S. Osborn (March 25): Specimen of borer collected at Poulan, Worth County. Said to be destroying a number of cherry-laurel trees (Prunus caroliniana). (Det. C. Heinrich as Conopia sp. exitiosa.)

Mississippi. C. Lyle (March 24): More than 24 reports of injury received between October 1938 and March 1939.

Kansas. H. R. Bryson (March 24): Reported from Coyville on March 16.

#### TARNISHED PLANT BUG (Lygus pratensis oblineatus Say)

Virginia. A. M. Woodside (March 27): Observed on peaches in small numbers today.

Georgia. J. E. Webb, Jr. (March 23): Jarred in some numbers from peach trees in Elberta orchard in the Cornelia section on March 22 and 23.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Mississippi. C. Lyle (March 24): Reported as causing injury to peach trees at Fayette in February.

BERRIES

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Kansas. H. R. Bryson. (March 24): Reported from Chetopa on March 12.

A CERAMBYCID (Ataxia crypta Say)

Alabama. J. M. Robinson (March 24): Dewberry and youngberry canes at Courtland reported as having galls on them formed by larvae.

GRAPE

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. G. A. Runner (March 23): Examinations of overwintering pupae during March in the Sandusky area showed a winter mortality of about 8 percent, as compared with 14 percent for April 1938, and 10 percent for March 1937.

PECAN

PECAN LEAF CASEBEARER (Acrobasis juglandis LeB.)

Georgia. G. F. Moznette (March 22): Immature overwintered larvae just beginning to leave hibernacula and starting to feed on developing buds of pecan at Albany.

PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Florida. S. O. Hill (March 23): Opening pecan buds at Monticello found to be infested by overwintered larvae on March 13.

Oklahoma. F. A. Fenton (March 23): Reported at Fort Gibson, Muskogee County.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Georgia. G. F. Moznette (March 22): In the course of studies at Albany first larva pupated on February 10 and first moth emerged on March 4.

Florida. S. O. Hill (March 23): First adult emerged from caged material on February 20 at Monticello.

Mississippi. C. Lyle (March 24): Reported as having injured pecan nuts in Brookhaven, Cleveland, and Holly Springs last October and November.

PECAN CARPENTER WORM (Cossula magnifica Stkr.)

Mississippi. C. Lyle (March 24): Specimen received from Petal on March 9.  
Report of injury received from McComb.

OBSOLETE SCALE (Chrysomphalus obscurus Const.)

Mississippi. C. Lyle (March 24): Specimens received from Bolivar and De Soto Counties, where pecan and oak trees were infested.

CITRUS

MEXICAN FRUITFLY (Anastrepha ludens Loew)

Texas. P. A. Hoidale (February): The adult fruitfly population in the Rio Grande Valley, as revealed by trap catches, was higher in February than during any similar period in the history of this project. In January only 154 flies were trapped, but early in February trap catches rapidly mounted and by the close of the month 2,150 flies had been submitted for identification. Many of the females were gravid. Some oviposition evidently took place late in January as the first larval infestation was discovered on February 14. Before the month closed 18 properties were listed as being infested.

GREEN CITRUS APHID (Aphis spiraeicola Patch)

Florida. J. R. Watson (March 23): Very scarce on the spring flush of growth, probably owing to dry weather and the hard, nonsucculent nature of the foliage.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Florida. J. R. Watson (March 23): Adults appearing in small numbers over the citrus belt.

Mississippi. C. Lyle (March 24): Specimens received with following information: Feeding on ligustrum at Bay Saint Louis and McComb; on Satsuma orange at Gulfport, Hattiesburg, and Richton; and on Cape-jasmine at Cary.

COTTONY CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (March 24): Infested plants received from Terry last December and from Vicksburg this month.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (March 23): Common on citrus.

CITRUS RED MITE (Paratetranychus citri McG.)

Florida. J. R. Watson (March 23): Purple mite becoming abundant on citrus.



SIX-SPOTTED MITE (Tetranychus sexmaculatus Riley)

Florida. J. R. Watson (March 23): Comparatively scarce on citrus.

FIG

FIG SCALE (Lepidosaphes ficus Sign.)

California. C. K. Fisher (March 4): First eggs deposited about March 4 at Fresno. Date of first oviposition in other years in the Fresno district has ranged from February 15 to March 20. Twice-stabbed ladybeetle (Chilocorus stigma Say) observed feeding on fig scale on Capri and Calimyrna fig trees, the first time this predator has been seen on fig trees. Present in moderate numbers on few trees observed and possibly of benefit in reducing the infestation.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

South Carolina. W. C. Nettles (March): Apparently on the increase in the State.

Georgia. K. P. Conradi (March 2): Specimens found on January 25. Heavy damage to turnips at Thomasville.

Florida. F. S. Chamberlin (March 10): Abundant on truck crops in Gadsden County for several weeks. Several infestations in tobacco plant beds reported recently.

Mississippi. C. Lyle (March 24): Larvae received from Barlow, Vossburg, and West Point in January. Reports of injury to turnips and other garden plants received from Columbia, Howison, and Long Beach.

Louisiana. B. A. Osterberger (March 27): Larvae observed feeding on several flowers at Baton Rouge on February 8. Most serious injury to calendula.

CUCUMBER BEETLES (Diabrotica spp.)

South Carolina. J. G. Watts (March 24): D. duodecimpunctata F. and D. balteata Lec. observed in small numbers at Blackville on various weeds and small grains. No D. vittata F. observed.

Virginia. A. M. Woodside (March 27): The spotted cucumber beetle observed feeding today.

Georgia. O. I. Snapp (March 6): Spotted cucumber beetles numerous on peach trees at Fort Valley, central Georgia, by March 6.

T. L. Bissell (March 9): Adults of D. duodecimpunctata numerous on wild-plum blossoms, the first seen this season at Bishop, Oconee County, central Georgia.

Mississippi. C. Lyle (March 24): D. duodecimpunctata reported as injuring corn at Columbia in January and at Osyka in February, and as injuring water-melons at Crystal Springs in March.

Texas. M. J. Janes (March 22): D. duodecimpunctata observed on February 13 causing light injury to lettuce in Galveston County. One or two specimens per head.

#### FLEA BEETLES (Halticinae)

Illinois. W. P. Flint (March 27): More than normal numbers taken in the usual hibernating quarters.

#### SEED-CORN MAGGOT (Hylemya cilicrura Rond.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Adults rather abundant at Norfolk in fields containing decaying organic matter.

Mississippi. C. Lyle (March 24): Larvae, probably belonging to this species, received from Gulfport in March with injured butterbeans that had been planted.

#### MOLE CRICKETS (Gryllidae)

South Carolina. F. Sherman (March): Several inquiries from the eastern part of the State.

#### POTATO AND TOMATO

##### TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Florida. J. R. Watson (March 23): Unusually heavy infestation on tomatoes in Manatee County.

##### COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Alabama. J. M. Robinson (March 24): Taken at Auburn on March 21.

Louisiana. C. O. Eddy (March 27): Adults apparently doing more damage this year than usual. Many growers are using control measures.

##### A WEEVIL (Collabismodes cubae Boh.)

Florida. J. R. Watson (March 23): Previously sent in as a pest of peppers; specimens submitted with the statement that it was rather heavily infesting several hundred acres of tomatoes in Dade County, nining the stems as it does in peppers and doing severe damage by dwarfing the plants and fruit.

A MIRID (Engytatus geniculatus Reut.)

Georgia. T. L. Bissell (March 17): Tomato plants in a greenhouse at Experiment, central Georgia, attacked. Stems and branches near the tops of plants girdled, and a few plants stunted. Adults and nymphs of various sizes present. First noted on February 18. Not seen before by the grower in 8 years of experience. (Det. by H. H. Knight.)

POTATO APHID (Macrosiphum solanifolii Ashm.)

Delaware. M. D. Leonard (March 19): Earlier in March there was a fair infestation on a number of potted tomato plants in a greenhouse at Wilmington but by now parasites have almost cleaned it up.

TOMATO AND POTATO PSYLLID (Paratrioza cockerelli Sulc.)

Texas. F. L. Thomas and J. C. Gaines (March 22): Both nymphs and adults collected on tomatoes and beans at Weslaco, Hidalgo County, in the lower Rio Grande Valley, on March 1, the first time the insect has been reported in that immediate area.

BEANS

BEAN APHID (Aphis rumicis L.)

Delaware. M. D. Leonard (March 24): Present in moderate numbers on potted greenhouse bean plants at Wilmington during March.

BEAN LEAF ROLLER (Urbanus proteus L.)

Mississippi. C. Lyle (March 24): Specimens received in November 1938 from Gulfport with statement that they were on pole beans.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Virginia. H. G. Walker and L. D. Anderson (March 25): A few butterflies observed flying over fields of young cabbage at Norfolk but no eggs found. Very scarce at Norfolk, as well as cabbage looper (Autographa brassicae Riley) and the diamondback moth (Plutella maculipennis Curt.).

South Carolina. F. Sherman (March): First adult for the year noted at Clemson on March 9.

Missouri. A. C. Burrill (March 22): Adult observed at Jefferson City, visiting flowers of Scilla sibirica.

Oklahoma. F. A. Fenton (March 24): Cabbage worms noted at Indianola, Pittsburg County, and at Bixby, Tulsa County.



CABBAGE WEBWORM (Hellula undalis F.)

Mississippi. C. Lyle (March 24): Specimens received from Lucedale in November, with report that they were feeding on cabbage.

APHIDS (Aphiidae)

Delaware. M. D. Leonard (March 24): Light infestation of Myzus persicae Sulz. during March on potted greenhouse cabbage plants at Wilmington.

Virginia. H. G. Walker and L. D. Anderson (March 25): Cabbage aphids rather scarce at Norfolk; not more than 4 percent of plants examined in any field found to be infested.

South Carolina. W. C. Nettles (March): Aphids, presumably Brevicoryne brassicae L., reported as infesting spring cabbage.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Utah. G. F. Knowlton (March 20): Reported as beginning to emerge from hibernation at Logan.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

South Carolina. J. G. Watts (March 24): Some activity of adults in hibernation cages at Blackville on warm days throughout February and March. Some activity in the field by the middle of March.

CELERY

ONION THRIPS (Thrips tabaci Lind.)

Florida. J. R. Watson (March 23): Reported as very abundant on celery at Sanford, less so in Sarasota County.

SPINACH

GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Spinach aphids very abundant in many early spinach fields about March 1 at Norfolk. Infection with fungous disease killed a very high percentage, resulting in a scarcity of the pest.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

North Carolina. W. A. Thomas (March 6): Emergence from hibernation began in the

Chadbourn area on March 6. Soon abundant on buds of native host plants adjacent to strawberry fields. Only a single specimen observed feeding on pollen of open strawberry flowers. No eggs observed nor any evidence of cut buds.

STRAWBERRY CROWN BORER (Tyloderma fragariae Riley)

Kentucky. W. A. Price (March 24): Fully developed eggs found first on March 7, in dissected beetles from western Kentucky indicating that oviposition might be expected.

APHIDS (Aphidae)

Louisiana. B. A. Osterberger (March 27): Green aphid found on strawberry leaves at Hammond, Tangipahoa Parish, on January 23. Strawberry root aphid (Aphis forbesi Weed) numerous in some strawberry fields on January 23 at Hammond.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Rather abundant in a great many strawberry fields at Norfolk during March.

Texas. M. J. Janes (February 20): Strawberry plantings in Galveston County are being killed out where control measures were not used.

TOBACCO

TOBACCO MOTH (Ephestia elutella Hbn.)

North Carolina. W. D. Reed and J. P. Vinzant (March 7): Larvae, about full grown, found alive in the center of small piles of scrap tobacco spread on land last fall at Reidsville. First record of larvae as overwintering on the farm outside of growers' pack houses.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Florida. F. S. Chamberlin (March 17): Infestations on tobacco plant beds very light in Gadsden County.

MIDGES (Diptera)

South Carolina. W. C. Nettles (March): Midge larvae, species undetermined, have done some damage in tobacco seed beds.

# COTTON INSECTS

## BOLL WEEVIL (Anthonomus grandis Boh.)

- Florida. C. S. Rude and L. C. Fife (February 11): Live weevils observed in old bolls on plants standing in fields of the Sea Island belt in Florida. (February 18): Live weevils found in cages in which heavily infested bolls were placed last October.
- Mississippi. E. W. Dunnam and J. C. Clark (March 25): Reported from Bolivar County that eight live weevils were found in rubbish in a clearing of new ground.
- Louisiana. R. C. Gaines and assistants (March 11): Two weevils taken on flight screens in Madison Parish for the week ended March 11. (March 18): No weevils taken on field flight screens during the week ended March 18. (March 25): Weevils taken on field flight screens in Madison Parish for the week ended March 25 totaled four, as compared with two in 1938 and one in 1937.
- Texas. R. W. Moreland (March 4): A few weevils found clinging to sides of cages in Brazos County but no activity noticed, owing to unfavorable conditions. (March 11): Some weevil activity noticed in a few cages in Brazos and Burleson Counties on March 9 and 10. Found out of hibernation in other cages on other dates but no activity observed. (March 18): A few weevils found active in hibernation cages on March 13 and 14. No activity noticed since, as it has been too cool.

## PINK BOLLWORM (Pectinophora gossypiella Saund.)

- Texas. A. J. Chapman (March 18): Spring examinations of larvae installed in hibernation cages in Presidio County in October 1938 showed a negligible winter mortality. Examinations indicate that a large number of moths should emerge from this material.

## COTTON FLEA HOPPER (Psallus seriatus Reut.)

- Louisiana. C. O. Eddy (March 27): First emergence of nymphs from hibernation cages on March 27.
- Texas. R. W. Moreland (March 18): First emergence in hibernation cages in Brazos and Burleson Counties reported on March 13.
- R. K. Fletcher (March 22): First-instar nymphs found on March 21 on the primrose, Oenothera sp., at College Station.

## TARNISHED PLANT BUG (Lygus pratensis oblineatus Say)

- Louisiana. R. C. Gaines and assistants (March 11): Total of 39 tarnished plant bugs taken on flight screens in Madison Parish for the week ended March 11. (March 18): Thirty-six collected on flight screens for the week ended March 18. (March 25): L. pratensis taken on flight screens for the week ended March 25 totaled three, as compared with none in 1937 and 1938.



# FOREST AND SHADE-TREE INSECTS

## CANKERWORMS (Geometridae)

Ohio. T. H. Parks (March): Male moths flying and collected at light on March 4 and 5.

Illinois. W. P. Flint (March 27): A few adults of spring cankerworm (Paleacrita vernata Peck) observed in February. During the second half of March, particularly during the week of March 19-25, there was a very heavy movement of moths from winter hibernating quarters up the trees. Heavy flight of male moths noted, even in the extreme northern end of the State.

Missouri. A. C. Burrill (February 13): Moths, 30 or more, observed coming to night lights at windows in Jefferson City.

L. Haseman (March 10): First flight of male moths occurred late in February and up to March 10 only occasional specimens observed on warm evenings. A heavy infestation over a great deal of the State this spring is indicated. (March 22): Increasing numbers of male spring cankerworm moths on the wing during warm evenings at Columbia since the middle of March.

Iowa. H. E. Jaques (March 22): Spring cankerworm active since about March 10, exceedingly on the nights of March 19 and 20. In some places bands on trees were so completely covered with females that they were bridged over, necessitating renewal of bands from day to day. Average number of eggs in 123 females was 135 per insect. One elm had 123 females caught in the band.

Nebraska. M. H. Swenk (March 20): Male moths of spring cankerworm first noted flying abundantly about street lights in Lincoln, Lancaster County, during the night of March 13, indicating start of period of activity of this pest. Evident that the general outbreak, which began in 1931 after 11 years of practically no trouble and has steadily increased each year, will continue through the coming season. Inquiries as to control began on February 26, coming in from the area in east-central Nebraska where this pest was so injurious in 1938.

Kansas. H. R. Bryson (March 22): Moths quite active at lights during the last week. On March 12 many moths were collected on screens of dwellings.

Oklahoma. F. A. Fenton (March 24): Moths found very numerous on February 24 and by March 29 eggs had hatched and first-instar larvae were found on apple buds at the rate of three or more per bud.

## BROWN-TAIL MOTH (Nygmia phaeorrhoea Donov.)

New Hampshire. E. P. Felt (March 21): Winter nests reported as abundant in an orchard in the southern part of Hampton, individual trees having from 50 to more than 200 nests.

A WEEVIL (Dorytomus nucidus Say)

Oklahoma. F. A. Fenton (March 24): Reported at Perkins, Payne County.

OBSURE SCALE (Chrysomphalus obscurus Comst.)

Pennsylvania. E. P. Felt (March 21): Somewhat abundant on branches of horse-chestnut at Chester.

OAK

A GALL MIDGE (Callirhytis flavohirta Beutm.)

New York. E. P. Felt (March 21): Twigs of swamp white oak at Northport, Long Island, showed extreme infestation. Galls broadly oval, about 1/8 inch in diameter, and containing living maggots.

CARPENTER WORM (Prionoxystus robiniae Peck)

Massachusetts. E. P. Felt (March 21): Found in some numbers infesting an English oak at Orleans.

PINE

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New Jersey. M. D. Leonard (March 25): Considerable infestation observed on needles of a large ornamental Norway pine in a garden at Haddonfield.

Maryland. E. N. Cory (February 28): Infestation on white pine observed at Baltimore.

BARK BEETLES (Ips spp.)

Mississippi. C. Lyle (March 24): Pine infested with I. avulsus Eich. and I. calligraphus Germ. received from Morton in November 1938 and from Laurel in February.

INSECTS AFFECTING GREENHOUSE

AND ORNAMENTAL PLANTS

COMMON RED SPIDER (Tetranychus telarius L.)

Mississippi. C. Lyle (March 24): Infested plants received from Coffeeville and McComb in November 1938 and from Magnolia in March. Plants injured were arborvitae, camellia, and pyracantha. Reports of injury received from Corinth, Inverness, and Meridian.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujaefilinus Del G.)

Oklahoma. F. A. Fenton (March 24): Observed near Stillwater as early as March 7.

AZALEA

AZALEA SCALE (Eriococcus azaleae Const.)

Pennsylvania. E. P. Felt (March 21): Observed in some abundance on rhododendron at Glenolden.

Mississippi. C. Lyle (March 24): Infested Japanese azalea plants received from McComb and Natchez in March.

BAUHINIA

PYRIFORM SCALE (Protopulvinaria pyriformis Ckll.)

Florida. R. C. Althouse (February): Heavy infestation on mountain ebony (Bauhinia purpurea) at Saint Petersburg. (Det. by H. Morrison.)

CALENDULA

GREEN PEACH APHID (Myzus persicae Sulz.)

Delaware. M. D. Leonard (March 24): A light infestation present during March on a number of small potted calendula plants in a greenhouse at Wilmington.

CHRYSANTHEMUM

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

Delaware. M. D. Leonard (March 24): Infestation on potted chrysanthemum plants at Wilmington gradually increasing during March. A good many aphids still present.

MELON APHID (Aphis gossypii Glov.)

New York. F. S. Blanton (February 15): Common on chrysanthemums in a greenhouse at Babylon, Long Island. Five adults and nymphs found on stems. (Det. by P. W. Mason.)

CORALTREE

A PYRALID (Terastia meticulosalis Guen.)

Mississippi. C. Lyle (March 24): Larvae, feeding on coraltree, received from southern Mississippi in October 1936. (Det. by C. Heinrich.)



DOGWOOD

DOGWOOD CLUB GALL (Mycodiplosis alternata Felt)

Delaware. E. P. Felt (March 21): Somewhat common in the region about Wilmington and well known farther north. Recent laboratory work has demonstrated the pest to be this insect rather than Lasioptera clavula Beutm., a gall midge associated in earlier years with this somewhat common deformity.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Alabama. J. M. Robinson (March 24): Reported as attacking euonymus at Union Springs on March 18.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (March 23): Moderate infestation in Manatee and Lee Counties.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicis Curt.)

New Jersey. H. C. Donohoe (March 6): Holly in a cool greenhouse at Kingston severely attacked. Practically all mature leaves show infestation and plants rendered so unsightly as to be unsalable.

Delaware. E. P. Felt (March 21): Mines found in moderate numbers at Wilmington some plants showing an appreciable infestation.

A CHERMID (Paurocephala ilicis Ashm.)

Mississippi. C. Lyle (March 24): Injured twigs of yaupon received from Gulfport in February.

JUNIPER AND CEDAR

DEODAR WEEVIL (Pissodes nemorensis Germ.)

Alabama. J. M. Robinson (March 24): Reported as attacking deodar at Aliceville on March 20.

JUNIPER SCALE (Diaspis carueli Targ.)

New Jersey. M. D. Leonard (March 26): A number of garden ornamental juniper plants examined at Haddonfield showed from light to sufficient infestation to affect many of the branches.

NASTURTIUM

APHIDS (Aphiidae)

Delaware. M. D. Leonard (March): A light infestation of Aphis rumicis L. on some greenhouse nasturtium plants at Wilmington. Damage negligible. Only a few left of a somewhat greater infestation of Myzus persicae Sulz., which recently increased to considerable numbers, causing appreciable wilting of the leaves.

PANSY

APHIDS (Aphiidae)

Louisiana. B. A. Osterberger (March 27): Very numerous on pansy plants at Baton Rouge on January 26.

PRIVET

OLIVE SCALE (Parlatoria oleae Colv.)

Maryland. E. N. Cory (March 11): Infestation on privet at Baltimore.

FUSSY WILLOW

BEAKED WILLOW GALL (Phytophaga rigidae O. S.)

Maryland. E. N. Cory (March 13): Fussy willow infested at Arnold.

ROSE

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (March 25): Rose bushes at Haddonfield which were well infested throughout last season have no newly hatched aphids as yet.

Delaware. M. D. Leonard (March 19): The light infestation on rose in a greenhouse at Wilmington, reported on March 2, built up considerably but by now parasites have left relatively few live aphids.

Louisiana. B. A. Osterberger (March 27): Green aphids very numerous on rose bushes in the southern part of Louisiana.

TULIP

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

New York. F. S. Blanton (February 15): Fifteen adults and nymphs found on foliage of tulips at Babylon, Long Island. Very abundant on tulips in some places in Babylon. (Det. by P. W. Mason.)

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

ORIENTAL RAT FLEA (Xenopsylla cheopis Rothsch.)

Tennessee. F. C. Bishopp (March 29): Two specimens sent in on March 9 from Nashville where they were infesting rats in a grain store.

MOSQUITOES (Culicinae)

Florida. W. V. King (February): Larva of Anopheles atropos D. & K. identified on the Florida Keys, which represents the first record of this species in that locality. Larvae and adults of Culex bahianensis D. & K. identified from Key West, representing first record of its occurrence in the United States. Found breeding rather abundantly in brackish water.

Oregon. H. H. Stage (March 21): Several reports of Theobaldia incidens Thoms. received during the last week from Multnomah County. Found to be overwintered females.

California. P. Simmons (February 18): Mosquitoes, species unknown, were numerous and actively biting on February 18 on the Madera County side of the San Joaquin River at Mendota Dam. Weather warm with bright sun. Unexpectedly early date of activity for these insects.

SANDFLIES (Culicoides spp.)

Georgia. J. B. Hall (February 28): Some sandflies emerged at Savannah on a few unusually warm days in February. Not numerous enough to cause much annoyance.

Florida. J. B. Hall (February 28): Not numerous during the last month at Fort Pierce.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Michigan. E. I. McDaniel (March 23): Number of specimens submitted from the Detroit area. Received from time to time all winter from this district. (Det. by F. C. Bishopp.)

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Nebraska. M. H. Swenk (March 20): Observed in outdoor cellars and house basements since March 1, especially in the area from Box Butte County south to Cheyenne County and southeast to Furnas County.

CLOVER MITE (Bryobia praetiosa Koch)

District of Columbia. F. C. Bishopp (March 28): Several reports received from residents of Washington in the last few days of the clover mite invading homes and apartments.



CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody (March): Cases after branding of cattle reported.  
(February 5): Natural case found on a sheep at Valdosta. (March 7):  
Case on cow found on a farm near Valdosta. (March 22): Found on a sheep  
and a goat on March 13 and 16.

Florida. A. L. Brody (February 21): Report from Jasper County of an infestation on a hog.

Texas. O. G. Babcock (February 8): Infestation of a sheep found, the earliest seasonal infestation observed in the vicinity of Sonora in the last 17 years.

CATTLE GRUBS (Hypoderma spp.)

Georgia. A. L. Brody (November 28, 1936): Larvae, probably H. lineatum DeVill., just began to appear in the backs of young steers at Valdosta. Those removed were all in the second stage. (March 14): On January 4, 60 warbles, probably H. lineatum, removed from the back of a calf at Valdosta; 4 fully mature. On February 13 3 flies emerged in the laboratory.

Missouri. L. Haseman (March 22): Most ox warbles had matured by March 20 and left the backs of cattle, if not forcibly removed earlier or destroyed with treatments.

Texas. R. Melvin (March 21): Heel flies quite active the first week in March at Menard.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody (February 28): About 75 to 100 observed per steer at Valdosta.

Texas. R. Melvin (March 21): Cattle examined today harbored from 10 to 50 horn flies each.

STABLEFLY (Stomoxys calcitrans L.)

Georgia. A. L. Brody (March 3): Large numbers found emerging at Valdosta.

CATTLE BITING LOUSE (Bovicola bovis L.)

South Carolina. W. C. Nettles (March): Some degree of infestation found on most cattle.

A BLOWFLY (Phormia sp.)

Georgia. A. L. Brody (March 1): Infestations of black blowfly reported as frequent from February 3 to 10 and on February 27.

HORSE

SUCKING HORSE LOUSE (Haematopinus asini L.)

North Dakota. J. A. Munro (March 16): Specimens recently sent in from Driscoll, Burleigh County, with the statement that they were abundant on a horse.

POULTRY

FOWL TICK (Argas miniatus Koch)

Oklahoma. F. A. Fenton (March 23): Blue bug reported at Ryan, Jefferson County, on chickens.

SHEEP

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody (February 18): One partly engorged female found on ear of a sheep at Valdosta.

GOAT

GOAT LICE (Linognathus sp.)

Georgia. A. L. Brody (March 8): Kids at Experimental Farm at Valdosta heavily infested.

DEER

BOTS (Cephenomyia sp.)

Utah. G. F. Knowlton (March 20): Several deer, which have died near Logan recently, heavily infested. (Det. by D. G. Hall.)

HOUSEHOLD AND STORED PRODUCTS INSECTS

TERMITES (Isoptera)

United States. R. A. St. George (March 24): Winged adults of Reticulitermes flavipes Koll. now reported as emerging in numbers in heated basements in Pennsylvania, Maryland, Washington, D. C., and Virginia. Adult specimens accompanied reports in many cases. (March 27): General emergence of R. flavipes observed during the last few days outdoors in Maryland, Washington D. C., and Virginia.

New Jersey. M. D. Leonard (March 25): Considerable number of winged termites (R. flavipes) active within a porch at Haddonfield. First flight observed this season.

Maryland. E. N. Cory (March 13): Termites observed in a church at Baltimore.

- North Carolina. R. J. Kowal (March 6): First reported swarm at Asheville on February 20.
- Kentucky. W. A. Price (March 24): Swarms of termites observed in Lexington on March 6.
- Missouri. L. Haseman (March 22): A few reports of early spring swarming of termites received from central and northeastern Missouri since March 1.
- Kansas. H. R. Bryson (March 22): Termites observed as becoming active near the surface of the soil. Considerable swarming about March 12 and 13. Activity early, because of the soil's not being frozen to any extent. Reports received from Manhattan, Emmett, Belvidere, and Salina.
- Oklahoma. F. A. Fenton (March 24): Reports of infestations, probably R. flavipes, received from Elk City, Beckham County; Shattuck, Ellis County; and Ponca City, Kay County. Last record of damage to trees; first two of infestations in houses.
- Utah. G. F. Knowlton (March 11): Adults observed emerging and flying about at Logan today.

#### ANTS (Formicidae)

- New Jersey. M. D. Leonard (March 25): Considerable swarm of a small black ant in flight around a small evergreen around noon today at Haddonfield.
- Maryland. E. N. Cory (February 25): Prenolepis sp. observed at Upper Marlboro. (Det. by G. S. Langford.)
- Mississippi. C. Lyle (March 24): Numerous complaints as to ants causing trouble in houses received from Clarke, Clay, Hinds, Lowndes, Noxubee, and Union Counties. Specimens of Argentine ant (Iridomyrmex humilis Mayr) received from Laurel, Starkville, and Utica. Camponotus caryae Fitch received from Laurel in January and from Jackson in February, with reports of considerable annoyance. Pharaoh's ant (Monomorium pharaonis L.) received from Greenville, Leland, University, and West Point, and reported as being troublesome.
- Missouri. A. C. Burrill (March 23): Northern honey ant (Prenolepis imparis Say) observed at Jefferson City during January, February, and March. Tiniest black ant (Monomorium minimum Buckl.) observed on March 22 and 23.
- Kansas. H. R. Bryson (March 22): Yellow ants (Lasius interjectus Mayr) reported as swarming out in basements in a few residences in Manhattan. Reports also received from Hiawatha and Copeland.

#### A WASP (Polistes pallipes Lep.)

- Missouri. A. C. Burrill (March 11): First record of appearance at Jefferson City this spring.



HOUSE CENTIPEDE (Scutigera forceps Raf.)

Missouri. A. C. Burrill (February 19): Observed in a house at Jefferson City as attacking a large black cockroach.

BOXELDER BUG (Leptocoris trivittatus Say)

Maryland. E. N. Cory (March 14): Reported as being in a house at Hagerstown.

Michigan. R. Hutson (March 28): Reported as coming out of hibernation at Muskegon, Pewanoy, and Paw Paw.

Iowa. H. E. Jaques (March 22): Numerous complaints received as bugs come out of hibernation.

Kansas. H. R. Bryson (March 22): More abundant this spring than for several years. Large numbers observed in Manhattan near maple trees and on the southern sides of buildings.

Nebraska. M. H. Swenk (March 20): Spring activity began about March 13, since when complaints of annoyance have been received from Sarpy, Douglas, Burt, Cedar, Pierce, and Platte Counties.

Utah. G. F. Knowlton (March 13): Annoyance reported from Salt Lake, Ogden, and Logan during this last week of warmer weather.

G. F. Knowlton and F. C. Harmston (March 24): Active and scattering from winter hibernation quarters, adults in flight being frequently seen at Logan.

INDIAN MEAL MOTH (Ephestia cautella Walk.)

New Jersey. H. C. Donohoe (March 4): A single adult taken in a seed store at Trenton. Inquiry revealed that moths, presumably of this species, are abundant each spring about bags of seed corn.

POWDER POST BEETLES (Lyctus spp.)

Maryland. E. N. Cory (March 21): Reported as attacking flooring at Baltimore and Church Hill on February 28 and March 21.

Kansas. H. R. Bryson (March 22): Report received from Sterling stating that powder post beetles had been working in the top of a walnut dresser for several years. Also reported as attacking new oak flooring at Toronto on March 11.

Oklahoma. F. A. Fenton (March 24): Reported at Shawnee, Pottawatomie County, as working in slabs used in log cabins.

BEETLES (Coleoptera)

Maryland. E. N. Cory (March 6): Hylotrupes bajulus L. reported from houses in Daniels Park and Berwyn on March 6. Confused flour beetle (Tribolium confusum Duv.) reported as attacking feedstuff at Sparrows Point on March 25.

Mississippi. C. Lytle (March 24): The black carpet beetle (Attagenus piceus Oliv.) sent in from Gloster in November 1938 with information that it was feeding on feathers. Reports of injury to floors and walls of houses by death watch beetle (Xyletinus peltatus Harr.) received from Natchez in October 1933 and from Big Creek and Lexington in January.

MISCELLANEOUS ITEMS

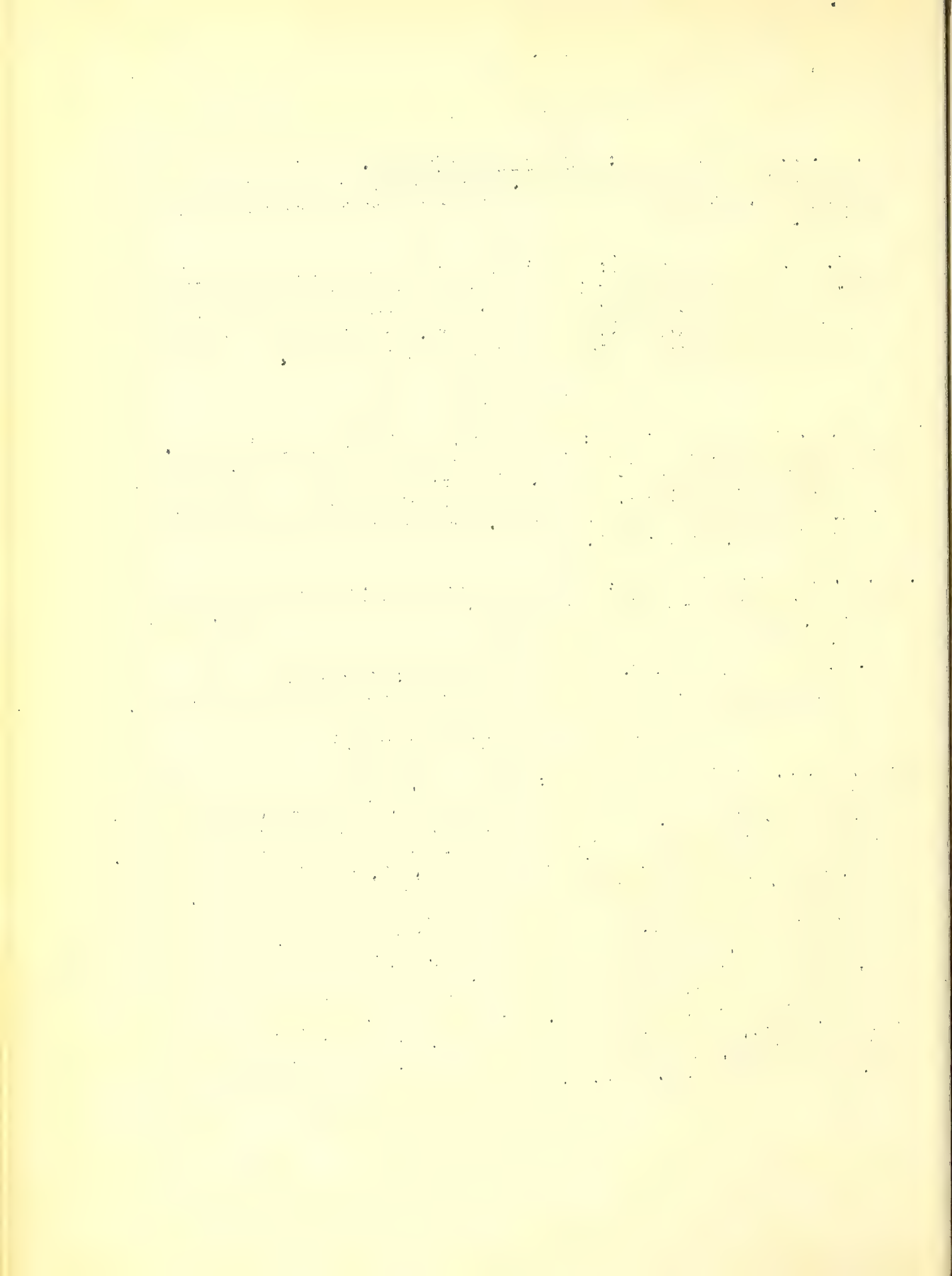
Georgia. T. L. Bissell (March 22): Chrysomelids (Dibolia borealis Chevr.) active on narrow-leaved plantain at Experiment on February 26. Much evidence of feeding and many eggs. On March 22 no beetles were seen and no recent feeding evident. Larvae found in mines from one- to two-thirds grown. One luna moth (Tropaea luna L.) caught at light in Spalding County, central Georgia, on March 14.

Utah. G. F. Knowlton (March 20): Gelechiid larvae (Metzneria lappella L.) reported on March 14 as infesting burdock seeds at Ogden. (Det. by C. Heinrich.)

G. F. Knowlton and F. C. Harmston (March 24): Mourning-cloak butterflies (Hamadryas antiopa L.) observed in flight on several occasions recently.

VETCH BRUCHID (Bruchus brachialis Fahr.)

New Jersey. L. J. Bottimer (July 1938): Of some 7,000 mature seeds of Vicia villosa, collected at Haddon Heights on July 19, July 26-27, and August 4, 1937, approximately 42.4 percent produced adults of the vetch bruchid and 17.7 percent adult hymenopterous parasites. Remaining seeds not examined. European Bruchobius mayri Masi constituted 96, 95, and 85 percent, respectively, of the Hymenoptera reared from the three collections. Emergence of this species started before July 19 and was heaviest during the first week of August. Very few reared after August 15. Handling the seed on April 18, 1938, resulted in 2 more B. mayri emerging on April 22, 1938, having hibernated within the seeds. Eupelmus allnyi French reared in small numbers during August 1937 from bruchid-infested seeds of the second and third collections only. Bruchid egg parasite, Uscana semi-funipennis Gir., first reared from eggs of B. brachialis during July 1937 at Haddon Heights. Again obtained at this locality the first week of July 1938. (Hymenoptera det. by A. B. Gahan.)





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BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING



## THE MORE IMPORTANT RECORDS FOR APRIL

The hatching of economic species of grasshoppers began in the Southwest during the last week in April. An outbreak of Oedaleonotus enigma Scudd. and Melanoplus devastator Scudd. was reported from the San Joaquin Valley of California, and of M. mexicanus Sauss. in the Imperial Valley. In Florida the eastern lubber grasshopper was seriously damaging narcissus in Clay County.

A north African and Indian weevil, Hypera brunneipennis Boh., was found for the first time in North America. Specimens were collected by L. P. Wehrle throughout approximately 15 square miles in the Yuma Valley of Arizona. Report has also been received of specimens having been collected in Imperial County, Calif.

There was a general increase in the larval population of the alfalfa weevil in the San Joaquin Valley of California. Present indications are, however, that the area infested has not increased.

The pea aphid occurred earlier than usual and in rather large numbers throughout the Middle Atlantic and South Atlantic States. It is also reported in eastern Kansas and in parts of Utah and Arizona. In Washington State the first damage reported in 10 years was under way in the Walla Walla district.

The San Jose scale appears to be on the increase in western New York and Georgia.

Emergence of codling moth adults was reported from Alabama on April 4, in the Cornelia section of Georgia on April 24, and in the Yakima Valley of Washington State on April 18. In general throughout the apple-growing sections of the country winter survival is high.

Fruit aphids are generally numerous in the New England, Middle Atlantic, East Central, and West Central States.

The green citrus aphid was occurring in numbers in the upper east-coast citrus-growing section of Florida and is doing considerable damage to oranges in the Orlando section. There is also rather heavy infestation of citrus rust mite in practically all citrus-growing areas of that State.

The Mexican bean beetle first appeared in south-central Georgia on April 11 and on the 18th adults were found in the tidewater sections of Virginia.

The first general movement of the pea weevil from hibernation quarters to the pea fields in the Willamette Valley of Oregon occurred during the third week in April. This is nearly a month earlier than in 1938.

Cankervorms are reported as rather abundant on shade trees in Pennsylvania, Illinois, and Iowa.

Complete defoliation by tent caterpillars is occurring in northern California.



## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

- General. W. E. Dove (April 22): Hatching of economic species has begun in Arizona, California, Texas, New Mexico, and Oklahoma. A severe outbreak of Melanoplus devastator Scudd. in the San Joaquin Valley of California is reported and intensive control operations were started during this week. Reports of threatening infestations received from the Yuma Valley, Ariz. Hatching of Dissosteira longipennis Thos. reported to have begun in New Mexico on April 21. Control operations in this area expected to begin on April 25. Although hatching of nonmigratory species in northern Texas and southwestern Oklahoma is reported, control operations probably will not begin before the first of May. A very small hatch reported in Utah. Results of survey examinations show the extent of parasitization and predatorization to remain practically the same as reported last fall. Reduction in numbers of egg pods by natural factors during the winter months is negligible.
- Florida. J. R. Watson (April 22): Heavy infestation of Romalea microptera Beauv. on narcissus in Clay County. Young observed migrating to narcissus fields from a distance of several hundred feet. Only third-stage observed on April 14. Adults observed on April 17 in the southern part of Dade County.
- Michigan. R. Hutson (April 22): Surveys during the last week in Antrim, Charlevoix, Kalkaska, and Ogemaw Counties, in the northern part of the Southern Peninsula, indicate that grasshopper hatching has not yet started in the main infested areas; however, inspection of eggs reveals that development has progressed to a point where warm weather causes hatching.
- North Dakota. J. A. Munro (April 24): Usual reports of overwintered adult and nymphal forms. No hatching of M. mexicanus Sauss. or other economic species observed.
- South Dakota. H. C. Severin (April 24): Eggs had not hatched by April 21. Red mites very active in areas where eggs are abundant; carabid larvae also active.
- Oklahoma. C. F. Stiles (April 24): Reported as hatching in large numbers in Jefferson County. In a few localities young hoppers found present at the rate of 80 per square yard in pasture land in the northern part of Jefferson County and 30 per square yard in the southern part. Crop hoppers, perhaps M. bivittatus Say or M. differentialis Thos., reported as high as 35 per square yard in the southeastern part of Lincoln County.
- Montana. H. B. Mills (April 24): Overwintering grasshopper nymphs have been reported as appearing in considerable numbers in various parts of the State, but to date there have been no verifications of eggs hatching in crops.
- Utah. G. F. Knowlton and F. C. Harmston (April 8): Nymphs reported as hatching out in alfalfa fields at Greenriver, Emery County, and on warm southern slopes in some localities in Box Elder, Tooele, and Utah Counties.
- Nevada. G. G. Schweis (April 24): Reports filtering in that M. mexicanus is hatching in great numbers in Churchill, Washoe, and Lyon Counties. Control measures will be started at once.

California. C. C. Wilson (April 7): First generation of M. mexicanus hatching generally in the alfalfa fields throughout the Imperial Valley. Inspection made on March 22 indicated that in fields irrigated 8 to 10 days previously the hatch ranged from 90 to 100 percent, and nymphs ranged in size from first to third instars. In fields where the fall egg survey showed an average of 13 egg pods per square foot the nymphal population is estimated at 200 per square foot and had already destroyed approximately 25 percent of the first crop of alfalfa.

MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. J. A. Munro (April 24): First reports of hatching from Burleigh County on April 22.

South Dakota. R. A. Roberts (April 15): Reports of hatching received from Butte County on March 31.

H. C. Severin (April): Eggs were hatching in Butte County on April 3 and in Brule County on April 10.

Montana. H. B. Mills (April 24): Mormon crickets started hatching the first week in March in Lake and Sanders Counties and hatching is now general over the lower elevations in the State. It is estimated that from 50 to 75 percent of the eggs have hatched in the Yellowstone Valley.

Wyoming. R. A. Roberts (April 15): Reports of hatching in Fremont County on March 22.

Idaho. R. A. Roberts (April 15): Hatch reported at Mayfield, Elmore County, on March 13. Found on March 24 in first and second instars, principally the first, with rather heavy populations in small localized areas. Hatch in Washington County on March 27.

Utah. C. J. Sorenson (April 22): First hatching this season in the Silver City district of Juab County, north-central Utah, between March 24 and 30. Less than 5 percent of the eggs found hatched on the latter date.

Nevada. R. A. Roberts (April 15): In northern Nevada hatching reported at Winnemucca, Humboldt County, on March 14, and approximately an 80-percent hatch had occurred at the lower altitudes in Elko County by March 24.

Nevada. G. G. Schweis (April 24): Mormon crickets have hatched in the eastern and northern counties and there has been no great reduction in numbers. It will be necessary to carry on control measures over a large area in Elko, Humboldt, Eureka, Lander, and Pershing Counties during the coming season.

JAPANESE BEETLE (Popillia japonica Newm.)

General. C. H. Hadley and associates (April 25): Unusually late development of larvae early in the fall of 1938 largely overcome by the mild fall season, but a slightly higher than normal proportion of larvae entered hibernation as second-instar larvae. Owing to favorable weather conditions, winter larval mortality was negligible. Soil temperatures were above normal during



March but early spring larval activity was retarded by cool, wet weather in April and the overwintering soil population did not generally move up to the feeding position until the last week in April. Development of the overwintering population is slightly below normal. Recent larval surveys in different parts of the generally infested area indicate a somewhat higher than normal proportion of second-instar larvae at this time, with development further advanced in the southern part of its range. First field-collected adult recovered near a laboratory building at Moorestown, N. J., on April 24, undoubtedly an escape from one of the nearby greenhouses.

New York. D. M. Daniel (April 11): Diggings at White Plains, in the lower Hudson Valley, revealed larvae as follows: (1) 19 second-instar and 31 third-instar larvae from 4 diggings, 1 foot square; (2) 3 second- and 12 third-instar larvae from 1 digging; and (3) 1 first-, 6 second-, and 33 third-instar larvae from 3 diggings.

E. P. Felt (April 22): Grubs moderately abundant in turf at Scarborough Westchester County.

#### ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

New York. D. M. Daniel (April 11): Eight larvae observed in diggings in turf at White Plains.

#### WIREWORMS (Elateridae)

Nebraska. M. H. Swenk (April 20): True wireworms (Melanotus sp.) were the subject of control inquiries from Dodge County on April 3 and Kearney County on April 10.

Idaho. F. H. Shirck (April 13): Pacific coast wireworm (Limonius canus Lec.) observed at Greenleaf, in southwestern Idaho, feeding on seed pieces of newly planted potatoes.

Washington. H. P. Lanchester (April 20): L. canus, L. californicus Mann., L. infuscatus Mots., and L. subauratus Lec. observed at Walla Walla today, with indications that the primary flights of L. canus and L. infuscatus are nearly over.

E. W. Jones (April 20): Larvae of L. canus and L. californicus found feeding on onion plants near soil surface at Walla Walla during the first week of April.

California. M. W. Stone (April 20): Damage by sugar-beet wireworm (L. californicus) to melon seed; especially severe in a 60-acre planting near Downey, Los Angeles County. Siftings made 7 days after planting on March 20 showed an average of over 10 and as many as 24 larvae per hill. Damage by this species to young sugar beets in Orange County necessitated some replanting.

#### CUTWORMS (Noctuidae)

Georgia. T. L. Bissell (April 21): Injurious in gardens at Experiment, central Georgia, particularly to lettuce.



- Florida. C. S. Rude and L. C. Fife (April 8): Some damage to cotton in places in the Sea Island cotton-growing area.
- Tennessee. L. B. Scott (April 14): Normally abundant in pastures in Montgomery County, north-central Tennessee.
- South Dakota. H. C. Severin (April 24): Pale western cutworm (Agrotis orthogonia Morr.) reported as doing considerable damage to rye in Edmunds County, in the north-central part of the State.
- Nebraska. M. H. Swenk (April 20): Request for control information as to cutworms received from Dodge County on April 3.
- Texas. R. L. McGarr (April 22): Some damage noted in one field of cotton in Calhoun County this week.
- R. K. Fletcher (April 21): Observed injuring corn on April 3 at Fort Worth, Tarrant County.
- Idaho. F. H. Shirck (April 3): A young stand of red clover at Parma severely damaged by several species of cutworms. Plants eaten right down into the ground. Damage so severe that the crop on about 5 acres is totally destroyed.
- Nevada. G. G. Schweis (April 24): An outbreak of cutworms, variety unknown, reported from Pershing County as doing great damage to young stands of alfalfa.
- Washington. E. W. Jones (April 20): Observed damaging asparagus shoots in a few fields near Walla Walla from April 15 to 20.

EUROPEAN EARWIG (Forficula auricularia L.)

- Utah. G. F. Knowlton (April 20): Adults are becoming active and masses of eggs are being observed at Farmington in northern Utah.
- Washington. C. W. Getzendaner (April 20): Adults (mostly males) observed above ground nearly all winter, and increased in numbers in traps in March. Newly hatched nymphs and eggs ready to hatch were observed near Buckley, Pierce County, by W. W. Baker and B. J. Landis.

COMMON RED SPIDER (Tetranychus telarius L.)

- Georgia. T. L. Bissell (April 8): Abundant and injurious on a small clump of wild vetch at Griffin, central Georgia.
- Mississippi. C. Lyle (April 21): Plants infested with red spider, Tetranychus sp., received from Hancock, Lafayette, and Pike Counties. Camellia, Cape-jasmine, and rose injured.
- Louisiana. C. O. Eddy (March 30): On hollyhock at University, East Baton Rouge Parish. (Det. by E. A. McGregor.)

# CEREAL AND FORAGE CROP INSECTS

## WHEAT AND OTHER SMALL GRAINS

### HESSIAN FLY (Phytophaga destructor Say)

Kansas. E. T. Jones (April 20): Dissection of puparia from Junction City on April 8 shows winter survival of 92 percent and 52 percent of overwintered larvae pupated. No emergence observed. On April 19, 18 percent of flies emerged and 67 percent of total larvae pupated. Only 2 percent of plants infested with eggs in spot heavily infested with puparia. Emergence delay and oviposition curtailed by cool weather.

### CHINCH BUG (Blissus leucopterus Say)

Iowa. H. E. Jaques (April 24): Observed in threatening numbers in Henry, Guthrie and Fremont Counties.

### GREEN BUG (Toxoptera graminum Rond.)

Kansas. H. R. Bryson (April 24): According to E. G. Kelly and R. H. Painter the green bugs are present in the southern part of the State. Colonies numerous in oats reported in Greenwood County and vicinity. Wheat has grown rank in many localities; and there has been no outbreak. The low temperature during part of April has been unfavorable to parasites.

Oklahoma. F. A. Fenton (April 21): The outstanding pest in Oklahoma this month. Heavy infestations found in north-central counties, shading to medium and light to the east, west, and south. Most of infested fields are barley, although some infestation is found in wheat. Hard rains and activity of lady beetles apparently have checked the spread of the infestation.

### WHEAT WHITE GRUB (Phyllophaga lanceolata Say)

Oklahoma. F. A. Fenton (April 21): Reported from Bartlesville, Washington County and Okeeno, Blaine County. One field in Cotton County reported as plowed up, owing to activity of pest. Infestation generally is much less severe than a year ago.

### PLAINS FALSE WIREWORM (Eleodes opaca Say)

Nebraska. M. H. Swenk (April 20): Found infesting wheatfields from Kimball and Furnas to Franklin Counties during the third week in March.

## CORN

### EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

New York. L. A. Carruth (April 22): Surveys during the second week of April in standing cornstalks and stubble indicated an overwintering larval mortality of about 12 percent on western Long Island and a somewhat higher mortality in the region of Albany, in the Hudson Valley.



New Jersey. C. A. Clark (April 25): Pupation of overwintered larvae is from 2 to 3 weeks later than in 1938 in Burlington, Monmouth, and Middlesex Counties.

SOUTHERN CORN ROOTWORM (Diabrotica duodecimpunctata F.)

South Carolina. J. G. Watts (April 22): Injury on the increase in the Blackville area since April 1. Activities restricted to corn on low, heavy soil.

Georgia. T. L. Bissell (April 12): A few beetles observed on various flowers and plants at Tifton and Enigma. More abundant at Experiment. (April 21): Well-grown larvae found in soil near Austrian pea plants in sandy soil at Experiment. Beetles still common on alfalfa and various blossoms, and 1 found feeding on cabbage. (April 22): Four taken per 100 sweeps of net on alfalfa at Experiment.

Texas. R. K. Fletcher (April 21): Reported as causing severe injury to corn on March 31 at Wallis, Austin County.

ALFALFA AND CLOVER

A WEEVIL (Hypera brunneipennis Boh.)

Arizona. O. C. Bartlett (April 26): Heavy weevil population found by L. P. Wehrle on April 11, throughout approximately 15 square miles in the Yuma Valley. Feeding on clover and alfalfa. Larvae, pupae, and adults found in great numbers. (Det. by L. L. Buchanan.)

California. J. C. Harlin (April 28): H. brunneipennis was found in four spots in the vicinity of Winterhaven, in Imperial County today.

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. G. F. Knowlton (April 8): Adults observed in several localities in northern Utah, and small larvae found infesting alfalfa in one field.

California. A. E. Michelbacher (April 21): Infestation in the San Joaquin Valley the heaviest since 1932. Injury in several fields borders on economic damage. Feeding noticeable before cutting, and in several fields populations are large enough that from 4,000 to 6,000 larvae were collected to 100 sweeps of an insect net. Although not serious, in most fields there was a general increase in the larval population throughout most of the infested area. Despite these facts, a survey of fields along the periphery of the infestation revealed no extensions. There was a marked increase in the larval population between March 30 and April 5. Rearing records showed about 40 percent of last-stage larvae as parasitized by Bathyplectes curculionis Thoms. on March 30. Larvae rather difficult to find in the region about Pleasanton on March 31, and in the region adjacent to San Francisco Bay, the number of larvae collected to 100 sweeps of the net for different fields ranged from 7 to 158. In the San Francisco Bay area 91 percent of last-instar larvae were parasitized. On April 5 the average number of larvae collected to 100 sweeps ranged from 22 to 378 in different fields, and 86 percent of last-instar larvae were parasitized.



CLOVER LEAF WEEVIL (Hypera punctata F.)

- Kentucky. W.A. Price (April 22): Specimens received from several points in the State, with statements that they were damaging clover rather severely.
- Utah. C. J. Sorenson (April 22): Reported as very abundant and preventing growth of alfalfa in the Smithfield district of northern Utah.

PEA APHID (Macrosiphum pisi Kltb.)

- New York. N. Y. State Coll. Agr. News Letter (April 24): Stem mothers in all stages of development observed at Wantagh, Nassau County, on clover seedlings on April 20. No breeding had taken place.
- Pennsylvania. H. E. Hodgkiss (April 19): Observed between the first and third instars in an alfalfa field examined on April 13 in Berks County, east-central Pennsylvania.
- Virginia. S. B. Fenne (April 22): Numerous on field plantings of peas in Lancaster County. Usually apparent much later when plants are larger. Heavy losses anticipated as damage is early and severe.
- H. G. Walker and L. D. Anderson (April 25): Observed heavily infesting alfalfa but very scarce in peafields at Norfolk.
- Georgia. T. L. Bissell (April 12): English peas at Enigma free of pea aphid. (April 22): Forty-five taken per 100 sweeps of net on alfalfa at Experiment.
- Kentucky. W. A. Price (April 22): Fairly common on alfalfa at Lexington on April 15.
- Kansas. H. B. Hungerford (April 17): Very abundant on alfalfa in the vicinity of Lawrence this year; severe injury to peas expected unless conditions change.
- H. R. Bryson (April 24): Pea aphid present in fields in southern part of the State and in alfalfa in the vicinity of Garden City.
- Utah. G. F. Knowlton and F. C. Harmston (April 5): Found hatching in northern Utah. First-, second-, and a few third-instar nymphs found on alfalfa 3 to 4 inches tall. (April 8): Observed to have hatched on alfalfa in east-central Utah. (April 20): Seriously damaging and retarding growth of alfalfa in fields near St. George, in the southwestern part of the State, many fields showing almost no growth. First adult wingless aphid taken in northern Utah this season, collected on April 19 at Layton, Davis County. Most now found are in the second or third instar. Adults more abundant at Greenriver, east-central Utah. (April 22): Many wingless forms now mature and some producing young at Plain City, northern Utah. Approximately 20 percent of the adults and fourth-instar nymphs examined were infested with internal hymenopterous parasites.

Arizona. W. A. Stevenson (April 22): Infestation in alfalfa in Pima County, southern Arizona, on the increase.

Nevada. G. G. Schweis (April 24): Alfalfa aphid reported as damaging alfalfa fields in Washoe and Douglas Counties.

Washington. R. D. Eichmann (April 14): First damage in 10 years reported from Gardena, Walla Walla County. Two large alfalfa fields affected. Heavy populations in most fields in the vicinity. First cutting ruined. Winged forms migrating from this vicinity, and found in all alfalfa around Walla Walla. Many apparently immigrants. Erosion-control alfalfa near future pea-fields yields winged immigrants. (April 21): Survey of 72 fields in 8 southeastern counties revealed only 1 concentrated hay-producing district of about 12 sections in Walla Walla County as suffering damage. Two other small isolated fields in Grant and Richland Counties showed damage.

Oregon. M. M. Reeher and L. P. Rockwood (April 15): Very few on alfalfa in the Willamette Valley in October 1938, and November 1938 was colder than normal. Scarce in early spring, indicating few eggs laid on this host in the fall of 1938. First mature stem mother observed on March 22. Despite favorable weather conditions since March 16, populations on alfalfa still low in most fields seen. Most fall populations seen on vetches and Austrian winter field peas in the Willamette Valley moderate at the beginning of the winter, continuing low through the winter. Rapid increase since March 15 on all early fall-sown annual legumes. Alates very scarce now and no signs of movement into late fall-sown vetches or peas yet observed. Coccinellids and syrphids more abundant than last year but dry weather has kept down fungous diseases of aphids.

A MITE (Tetranychina mcdonoughi McG.)

Louisiana. C. O. Eddy (March 30): Found on clover and other plants at University, East Baton Rouge Parish. (Det. by E. A. McGregor.)

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Georgia. T. L. Bissell (April 22): Two taken per 100 sweeps of net on alfalfa at Experiment.

TARNISHED PLANT BUGS (Lygus spp.)

Georgia. T. L. Bissell (April 22): Thirty-one adults and nymphs of L. pratensis oblineatus Say taken per 100 sweeps of net on alfalfa at Experiment.

Arizona. L. L. Stitt (April 7): Newly emerged adults of L. elisus hesperus Knight and L. pratensis oblineatus found on alfalfa in nearly every field examined in Yuma County. Nymphs present are mostly in the fifth instar. Observations indicate the first generation for 1939 as nearly completed. Eggs well developed in a few adults. A number of blasted buds, typical damage, found in one field where the population was over one bug per sweep.

W. A. Stevenson (April 22): Sweeping records showed some increase in populations in Pima County, L. pratensis oblineatus predominating to date.



Utah. G. F. Knowlton and F. C. Harnston (April 5): L. elisus Van D. and L. elisus hesperus abundant on young alfalfa in northern Utah.

ALFALFA CATERPILLAR (Colias eurythome Bdv.)

Georgia. T. L. Bissell (April 22): One caterpillar taken per 100 sweeps of net on alfalfa at Experiment.

Utah. G. F. Knowlton (April 12): Abundant in two alfalfa fields examined in northern Utah.

HARVESTER ANTS (Pogonomyrmex spp.)

Oklahoma. F. A. Fenton (April 21): The red harvester ant (P. barbatus F. Smit) reported from Minco, southwest of the central part of the State.

Utah. G. F. Knowlton (April 14): Harvester ants are damaging alfalfa by clearing numerous spots of the vegetation at Garland, in northern Utah.

COWPEAS

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Georgia. T. L. Bissell (April 11-12): One found, which had apparently fed on pea leaves and was in soil by plant, in 2 days' scout on beans and volunteer cowpeas in the vicinities of Tifton and Enigma, south-central Georgia. None found in hibernation near last year's fields. (April 21): Adults observed today at Experiment on cowpeas, trap plants set in field; the first emerged from hibernation.

F R U I T I N S E C T S

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (April 20): Inquiries received from Douglas, Nuckolls, and Harlan Counties.

Oklahoma. F. A. Fenton (April 21): Reported on hackberry at Roosevelt; on pecan at Ada; and on elm at Chandler.

TARNISHED PLANT BUG (Lygus pratensis oblineatus Say)

New York. N. Y. State Coll. Agr. News Letter (April 10): A few observed on war days at Poughkeepsie, but no injury. Noted on apple buds in Rockland County on April 3. (April 17): Observed in Dutchess County to the northern boundary of the county.

Washington. Ortho News (April 17): Troublesome this year in the Yakima Valley, after comparative scarcity for about 10 years.



SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

New York. N. Y. State Coll. Agr. News Letter (April 10): Apparently on the increase on peaches and prunes in Niagara County and on apple in Orleans County. More orchards infested this spring than noted in some time.

Georgia. O. I. Snapp (April 19): Four-year-old peach orchard killed near Fort Valley, central Georgia. Infestation still greater than that of an average year.

Washington. E. J. Newcomer (April 18): An unusual degree of parasitization by Aphelinus sp. noted at Yakima. Percentage of parasites not estimated, but over 100 reared from about 12 feet of heavily infested twigs of apple and pear.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

New York. N. Y. State Coll. Agr. News Letter (April 10): Apparently increasing in Orleans County this spring, as more orchards are infested than have been noted in some time.

Michigan. R. Hutson (April 22): Reported as prevalent on apple at Empire, in the northern part of the Southern Peninsula.

PACIFIC MITE (Tetranychus pacificus McG.)

Washington. Ortho News (April 17): Observed migrating up trees for about 10 days, numbers having apparently wintered successfully under the bark. Reported as being well up in tops of trees in the Yakima Valley on April 15.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. N. Y. State Coll. Agr. News Letter (April 10): Examination of bands in the vicinity of Poughkeepsie indicates a low larval mortality. Of 219 larvae examined on March 21 only 12 percent reported as dead.

Delaware. L. A. Stearns (April 7): On March 28 there was 80-percent survival and no pupation of overwintered larvae.

Virginia. A. M. Woodside (April 22): About 25 percent of larvae have pupated at Staunton.

Georgia. J. E. Webb, Jr. (April 25): First moths emerged in insectary at Cornelia on April 19. On April 24 first field record of moths was of 14 caught in 10 traps in an apple orchard at Cornelia.

Alabama. J. M. Robinson (April 24): Larvae and pupae more abundant; some adults emerged on April 4.

Kentucky. W. A. Price (April 22): First pupae of the year found on April 3 at Henderson; on April 4 at Princeton; and on April 10 at Lexington. Despite cool weather, by April 18 pupation at Louisville amounted to about 15 percent.

Indiana. L. F. Steiner (April 6): Of more than 100 larvae taken from ground debris and under rough bark in the last few days at Vincennes none had pupated. (April 25): Examinations on April 18 indicated pupation under rough bark in the Vincennes area to average 6 percent; now 14 percent. Development 8 days later than in 1938 on this date, indicating that emergence will begin around May 3.

Missouri. L. Haseman (April 27): Pupation began in southern Missouri about April 15; no moth emergence reported up to April 19. In central Missouri no pupation observed up to April 26. Carryover of larvae greatly reduced over most of Missouri.

Oklahoma. F. A. Fenton (April 21): Reported from Stilwell, Adair County, in the northeastern part of the State.

Utah. C. J. Sorenson (April 22): High winter survival observed over the entire State.

Washington. E. J. Newcomer (April 18): Owing to temperatures above normal during the last month in the Yakima Valley, the season is a week earlier than in 1938, which was about normal. Pupae observed for about 2 weeks. First moths emerged near Yakima today, about a week earlier than in 1938.

#### EASTERN TENT CATERPILLAR (Molacosoma americana F.)

New York. N. Y. State Coll. Agr. News Letter (April 17): Egg masses rather plentiful in Dutchess County, particularly those of the forest tent caterpillar (M. disstria Hbn.). Scarce, however, on Long Island. No hatching to date. Plentiful in Niagara County.

D. E. Greenwood (April 26): Larvae just hatched out at Geneva.

New Jersey. C. H. Hadley (April 25): Eggs hatched at Moorstown about April 20. Webs occasionally noted on wild cherry. Development slow, owing to cool weather. Not very abundant.

Pennsylvania. H. E. Hodgkiss (April 19): Eggs hatching on March 4 in Mifflin County, and reported in different localities in eastern Pennsylvania at about the same time. Egg masses reported as abundant in the southwestern counties.

H. L. Blaisdell (April 20): Hatching of eggs observed in Wilkes-Barre on April 12.

Delaware. L. A. Stearns (April 5): First hatching observed at Rehoboth, southern Delaware, today.

Virginia. C. R. Willey (April 22): Very abundant in eastern Virginia. Nests observed in wild cherries and apple trees from Richmond to Williamsburg, and in Gloucester and Mathews Counties.

North Carolina. B. H. Wilford (March 27): Small larvae found within tents on wild cherry near Morganton, Burke County. No evidence of feeding. Leaves just beginning to develop.

A. M. Woodside (April 22): Observed on April 15 as abundant on apple and wild cherry near Statesville, Iredell County.

South Carolina. J. G. Watts (April 7): About one-third-grown larvae observed on wild cherry at Blackville.

Alabama. J. M. Robinson (April 24): Found to be abundant around Auburn on April 4.

Mississippi. C. Lyle (April 21): Specimens sent in on April 4 from Hattiesburg with statement that they were feeding on roses.

#### FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

New York. N. Y. State Coll. Agr. News Letter (April 24): Numerous egg masses noted in sweet cherries in Niagara County, and found to be a serious problem in a few orchards in Orleans County, western New York.

Illinois. W. P. Flint (April 25): Eggs about at peak of hatch on April 24 in the heavily infested area in western Illinois.

Missouri. L. Haseman (April 27): First evidence of egg hatching observed at Columbia on April 26.

#### EYE-SPOTTED BUDMOTH (Spilonota ocellana Schiff.)

Massachusetts. A. I. Bourne (April 25): A rather heavy infestation in several orchards in Middlesex County, eastern Massachusetts; the largest number of hibernating larvae observed or reported in eastern Massachusetts in recent years.

#### PISTOL CASEBEARER (Coleophora malivorella Riley)

Illinois. W. P. Flint (April 25): Present in serious numbers in several orchards in western Illinois. Apparently several local sources of infestation, covering an area of some 70 or 80 miles. Most heavily infested orchards at a considerable distance from each other.

#### A WEEVIL (Curculionidae)

Oklahoma. C. F. Stiles (April 24): An unidentified snout beetle, somewhat similar to the imbricated snout beetle, Epicaerus imbricatus Say, found feeding on foliage of young apple trees in Major County during the first part of April.



## APHIDS (Aphididae)

Massachusetts. A. I. Bourne (April 25): On the basis of overwintering eggs, various species very generally present throughout the State, and in unusually great abundance. Approximately 18,000 eggs per 50 twigs, averaging about 11 per linear inch. Only occasional hatching noted up to April 24. Rather rapid hatching induced by warm weather of the last 2 days, therefore young aphids can be found on buds still in the silver-tip stage.

New York. N. Y. State Coll. Agr. News Letter (April 10): Eggs numerous in orchards in Niagara, Orleans, and Wayne Counties, western New York. (April 17): Eggs abundant on apple trees in Nassau and Ulster Counties and not observed as hatched in Dutchess County, all in eastern New York. In Wayne County, eggs brought in about 3 weeks ago hatched this week. (April 24): In eastern New York all three species abundant on buds of trees receiving no dormant treatment in Nassau County, plentiful in orchards that had reached the green-tip stage in Orange County, and hatching rapidly on buds in Dutchess County, apparently about 60 to 80 percent in some orchard.

Iowa. H. E. Jaques (April 24): Considerable evidence of aphids on apple buds reported in Muscatine and Henry Counties.

APPLE APHID (Aphis pomi DeG.)

New York. N. Y. State Coll. Agr. News Letter (April 24): Hatching rapidly now in Columbia County. First observed on April 23 in the vicinity of Ithaca.

D. E. Greenwood (April 26): Out since April 24 at Geneva. Greenings in green-tip stage.

Pennsylvania. H. E. Hodgkiss (April 19): Hatching on fruit trees some days before any green was showing in the buds.

Wisconsin. C. L. Fluke (April 21): Young apple trees pretty well infested.

APPLE GRAIN APHID (Rhopalosiphum prunifoliae Fitch)

New York. N. Y. State Coll. Agr. News Letter (April 10): In the vicinity of Poughkeepsie an occasional grain aphid was observed on apple trees on April 7 and 8, whereas the first one was found in Rockland County on April 3. (April 17): In Ulster and Dutchess Counties first aphid was observed on April 11, and in Nassau County many were found on green bud tips of untreated trees. (April 24): Hatching rapidly now in Columbia County and found in large numbers in Ulster County; however, in Monroe County, western New York, only a few were found. Hatching started on April 17 at Ithaca, and aphids are now present in moderate-to-large numbers.

Pennsylvania. H. E. Hodgkiss (April 19): Found hatching some days before buds showed green.

Ohio. T. H. Parks (April 24): Newly hatched aphids very abundant on green tips of apple buds during the last 2 weeks.

- Indiana. L. F. Steiner (April 13): Abundant in the Vincennes area.
- Michigan. R. Hutson (April 22): Eggs hatching in all parts of the fruit district.
- Illinois. W. P. Flint (April 25): Large numbers in apple orchards throughout the State, most of them now having left the trees.
- Wisconsin. C. L. Fluke (April 22): Unusually abundant this spring. Most eggs observed to be in good shape.

ROSY APPLE APHID (Anuraphis roseus Baker)

- New York. N. Y. State Coll. Agr. News Letter (April): First hatch in Rockland County on April 11; about 1 in 25 a rosy aphid in 1 early orchard in Orange County; none observed in Dutchess County. First observed at Ithaca on April 23, only 1 being found after examining 100 buds. Still a few unhatched eggs.
- Pennsylvania. H. E. Hodgkiss (April 19): Hatching somewhat variable, owing to delayed spring weather and subsequent development of fruit buds. Hatching started in Adams County on April 3 and was slow throughout the southern tier of counties through April 14. Both first- and second-instar nymphs seen in Delaware County, southeastern Pennsylvania, on April 5. Not found throughout the east-central counties until April 11 and then only occasionally. Up to April 15, eggs not hatched in the rest of the State. Bud development 2 weeks later than last year.
- Indiana. L. F. Steiner (April 13): None found in the Vincennes area, although extensive survey was made.
- Illinois. W. P. Flint (April 25): Only very small numbers found.
- Georgia. J. E. Webb, Jr. (April 22): Showing up in considerable numbers in apple orchards in the Cornelia section. Damage very slight.

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

- Oregon. E. J. Newcomer (April 1): Observed to be parasitized by Aphelinus mali Hald. in a neglected apple orchard near Medford.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

- Massachusetts. A. I. Bourne (April 25): Rather scarce over the State; infestations spotted and limited to certain small areas of the orchards.
- New York. N. Y. State Coll. Agr. News Letter (April 10): Numerous in several peach orchards in Niagara County. (April 17): Eggs very abundant in Nassau County on apple trees, but apparently not so numerous in Dutchess County. (April 24): Eggs hatching in Nassau County.
- Pennsylvania. H. E. Hodgkiss (April 19): Eggs abundant in southeastern counties and found occasionally in other sections of the State.



PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (April 7): Pupation was 66 percent and survival 90 percent on March 28.

Georgia. O. I. Snapp (April 1): Moths reared from infested twigs of Photinia serrulata, collected at Griffin on September 20, 1938. (Det. by C. Heinrich.) (April 19): Full-grown larvae of first generation found in green peaches at Fort Valley, central Georgia, on April 17, although no twig injury was observed. First mature larva of the season emerged from a green peach at Fort Valley on April 19. Less than the usual number of broods anticipated in central Georgia, as first twig injury is frequently observed before this date.

Alabama. J. M. Robinson (April 24): Observed as unusually numerous.

Mississippi. C. Lyle (April 21): Peach twigs injured last fall received on April 10 from Belmont, Tishomingo County.

PEACH BORER (Conopia exitiosa Say)

New York. N. Y. State Coll. Agr. News Letter (April 24): Present and apparently more numerous than ever in Niagara County.

North Carolina. D. L. Wray (April 19): English laurel damaged at Greensboro.

Mississippi. C. Lyle (April 21): Report of injury received from Oxford on March 27.

Nebraska. M. H. Swenk (April 20): Reported as attacking peach trees, and, in instance, cherry trees in Nemaha, Johnson, Lancaster, Saline, and Nuckolls Counties from March 21 to April 20.

LESSER PEACH BORER (Conopia pictipes G. & R.)

New York. N. Y. State Coll. Agr. News Letter (April 24): Apparently more numerous than ever in Niagara County.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Virginia. A. M. Woodside (April 22): Activity of adults at Staunton restricted by cool weather. Those in captivity have fed very little with the exception of 2 days. Those in hibernation cages have not shown signs of activity.

South Carolina. J. G. Watts (April 7): Egg punctures observed on small plums about  $\frac{1}{4}$  inch in diameter at Blackville.

Georgia. J. E. Webb, Jr. (April 1): First beetles taken by jarring peach trees in the Cornelia district, as follows: 38 from 15 trees on March 28, as compared with 32 from 20 trees on March 21, 1938, and 4 from 24 trees on April 13, 1937.



O. I. Snapp (April 19): Adults began to appear on peach trees at Fort Valley on March 6, continuing until April 5. Infestation not heavier than that of an average year. First eggs in green peaches found on March 27, and larvae about 2 days old on April 5. First full-grown larvae of the season emerged from green peaches on April 19, a week later than last year but 2 weeks earlier than in 1937. It is therefore expected that Elberta, Georgia Belle, and possibly the last of the Hiley peaches in central Georgia will be attacked by a second brood.

Kentucky. W. A. Price (April 22): Adults began appearing at Mayfield on April 15, when Elberta peaches were in the split-shuck stage.

#### WHITE PEACH SCALE (Aulocaspis pentagona Targ.)

New York. N. Y. State Coll. Agr. News Letter (April 24): Peach cottony scale rather abundant in a young peach orchard in Niagara County.

#### CHERRY

##### BLACK CHERRY APHID (Myzus cerasi F.)

New York. N. Y. State Coll. Agr. News Letter (April 24): Observed in Rockland County on April 10, and a few noted in Dutchess County. (April 24): First seen on sweet cherries on April 20 at Ithaca.

##### CHERRY SCALE (Aspidiotus forbesi Johns.)

Ohio. T. H. Parks (April 24): Forbes scale reported as heavily infesting a sour cherry orchard near Zanesville, Muskingum County. Dormant treatment applied to trees late in March.

#### PEAR

##### PEAR PSYLLA (Psylla pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (April 10): Flies first noticed in Orleans County on March 26 and in Wayne County on March 23. (April 17): Flies began to emerge in Ulster County during the week of March 20. Little activity since but occasional eggs found. Flies observed in Dutchess County but no egg laying. No eggs found in Wayne County. (April 24): Adults, but very few eggs, observed in Nassau, Orange, and Dutchess Counties. Eggs found in small numbers in Ulster County; scarce in Orleans and Monroe Counties; found in small numbers at Ithaca on April 20.

Pennsylvania. H. E. Hodgkiss (April 19): Hibernating adults found on trees in Lebanon County on April 5. Some eggs laid, although bud development is considerably retarded. Eggs apparently have not been deposited very long.

##### PEAR THRIPS (Taeniothrips inconsequens Uzel)

New York. N. Y. State Coll. Agr. News Letter (April 17): First observed on pears in Ulster County on April 14. (April 24): Active but not numerous in Orange, Ulster, and Dutchess Counties. First found in Columbia County on April 21. A few observed on apples at Ithaca on April 23.

Oregon. S. C. Jones (March): Emergence began on approximately March 16, when prune buds still dormant. Peak of emergence reached when most prune buds showed green tips. Emerged in small numbers on March 30 in the Willamette and Umpqua Valleys. Infestation severe in individual orchards. Also reported from Umatilla County in northeastern Oregon.

California. S. F. Bailey (April 21): Infestation on pear and prunes widespread in north-central California in Sonoma, Solano, Napa, Lake, Eldorado, and Santa Clara Counties but not as acute as in 1930-33. Damage moderate to severe.

#### RASPBERRY

##### RASPBERRY FRUITWORM (Byturus unicolor Say)

Washington. B. J. Landis and W. W. Baker (April 20): Adults appeared in foliage of new canes of blackberry and in flowers of dandelion and trillium on April 17.

##### RED-NECKED CANE BORER (Agilus ruficollis F.)

Oklahoma. F. A. Fenton (April 21): Reported from Shawnee.

##### RASPBERRY ROOT BORER (Benbecia marginata Harr.)

Washington. W. W. Baker and B. J. Landis (April 20): Bramble crown borer began to break hibernation about the middle of March; larvae practically all out of hibernacula on April 17.

##### SALMONFLY (Taeniopteryx pacifica Banks)

Washington. B. J. Landis (April 20): Adults numerous on canes of red raspberry in a field at Roy on April 2. Canes had little foliage at the time. Damage to foliage severe in this field in 1938.

#### GOOSEBERRY

##### A GOOSEBERRY BORER (Xylocrius agassizi Lec.)

Washington. W. W. Baker (April 20): Adults emerged rapidly between April 16 and 17 during warm weather. Egg laying had begun by April 17.

#### GRAPE

##### GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

California. G. H. Kaloostian (April): First adult taken in a bait trap on April 1 in a vineyard near Woodlake, Tulare County. Collections from 21 traps in 7 vineyards in Tulare and Fresno Counties on April 10 included 22 females and 37 males. Ten females carried eggs.

GRAPE ROOT BORER (Paranthrene polistiformis Harr.)

Virginia. S. D. Roope (April 18): Worms found in roots of grapevines at Lynchburg on April 15. (Det. by C. Heinrich.)

GRAPE ROOTWORM (Fidia viticida Walsh)

Virginia. S. D. Roope (April 18): Worms found on roots of grapevines at Lynchburg on April 15. (Det. by W. H. Anderson.)

A WEEVIL (Glyptoscelis squamulata Crotch)

California. D. F. Barnes (April 10): Found on grape foliage on April 7 at Del Rey, Fresno County. From 20 vines 209 beetles collected, an average of 10 per vine, an infestation large enough to damage the small blossom buds rather extensively when the foliage area is small, as at present.

A FLEA BEETLE (Altica torquata Lec.)

Arizona. C. D. Lebert (April 10): Observed riddling new foliage in a vineyard near Mesa. Heavy damage in spots, necessitating control measures.

GRAPE LEAFHOPPER (Erythroneura cones Say)

Utah. G. F. Knowlton (March 28): Extremely abundant under fallen grapeleaf masses in one vineyard at Marriott, Weber County. Damage here severe in 1938, causing loss of crop of some varieties.

PECAN

APHIDS (Aphiidae)

Georgia. T. L. Bissell (April 19): Stem mothers of Monellia costalis Fitch observed on pecan in Spalding County, central Georgia. Adult stem mothers of Melanocallis caryaefoliae Davis seen on pecan trees in Spalding County, some with young.

COTTONY CUSHION SCALE (Icerya purchasi Mask.)

Alabama. J. M. Robinson (April 24): Reported on March 29 from Clio, in southeastern Alabama, as being on a large number of pecan trees.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. H. Spencer (April 11): Found in numbers in the upper east coast citrus section of Florida. Curling young-growth terminals and causing some damage to bloom.

H. T. Fernald (April 25): Very important near Orlando earlier in the season; recently observed again as doing considerable damage to orange.



CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (April 22): Weather over most of Citrus Belt very dry during the last month, resulting in a heavy infestation on citrus. Control measures used generally.

FIG

FIG SCALE (Lepidosaphes ficus Sign.)

California. C. K. Fisher (April 5): Eggs began hatching today in the Fresno district. A few young crawlers were still under the old scales; none found on wood or leaves. In 1937 hatching started about April 23, and in 1938 on April 16.

ALMOND

A DARKLING BEETLE (Metoponium abnorme Lec.)

California. E. O. Essig (April 12): Observed eating buds and foliage of almond trees at Antioch. Unusual for this beetle to feed in trees.

AVOCADO

PYRIFORM SCALE (Protepulvinaria pyriformis Oкл.)

Florida. J. R. Watson (April 22): Rather common on avocados in southern Florida.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Mississippi. C. Lyle (April 21): Apparently new adults sent in on April 19 from Forrest County.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. L. W. Brannon (April 24): First beetle of the season observed feeding on young snap beans on April 12 near Norfolk. Beans just up.

South Carolina. J. G. Watts (April 22): Adults observed at Blackville on various wild plants since April 7. Also on cucumbers, potatoes, and beans. Damage to seedling cucumbers not severe.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Virginia. H. G. Walker and L. D. Anderson (April 25): Observed feeding on young cantaloup plants in a coldframe at Norfolk.

CARROT BEETLE (Ligyrus gibbosus Deg.)

South Dakota. H. C. Severin (April 24): Beetles emerging now but have not begun to lay eggs.

FLEA BEETLES (Halticinae)

Idaho. F. H. Shirck (April 25): Several reports of damage in radish fields at Parma.

Utah. G. F. Knowlton (April 13): Severely damaging young radishes at Logan, often eating small leaves down to the crown.

THRIPS (Thysanoptera)

Florida. J. R. Watson (April 22): Heavy infestation of Thrips tabaci Lind. on celery in the Everglades section around Belle Glade.

Arizona. M. F. Wharton (April 3): Moderate-to-severe damage in spots on large lettuce plantings in the Salt River Valley by wheat or flower thrips (Frankliniella moultoni Hood). Control measures used. (Det. by S. F. Bailey.)

Texas. R. K. Fletcher (April 21): T. tabaci reported on flax and potato on March 15 at Weslaco, Cameron County. (Det. by F. Andre.)

CHANGA (Scapteriscus vicinus Scudd.)

Florida. J. R. Watson (April 22): Mole crickets, mostly the changa, flying during the month.

NORTHERN MOLE CRICKET (Gryllotalpa hexadactyla Perty)

Georgia. T. L. Bissell (April 10): Two adults found on April 6 and 10 at Experiment, moving on surface of ground. No damage noted.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

South Carolina. J. G. Watts (April): Adults on the increase at Blackville since the first of the month. First eggs observed on April 12.

Georgia. T. L. Bissell (April 12): Adults and eggs common on tomato at Enigma.

Alabama. J. M. Robinson (April 24): Showing up in unusually large numbers.

Mississippi. E. W. Dunnam (April 3): First beetle of the season noted at Leland on April 1, feeding on young potatoes.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. H. J. Ryan (April 14): Reported on tomato at Los Angeles on March 1. (Det. by V. E. Williams.)

J. C. Elmore (April 20): Young tomato plants infested in the San Pedro hills, southern California. From one to three leaf folders per plant in three fields totaling about 25 acres.

### BEANS

#### MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Virginia. L. W. Brannon (April 24): First adult of the season in the Tidewater Virginia area found feeding on young snap beans in the field in the vicinity of Portsmouth on April 13. Beans just up. Only 2 beetles found on 12 rows of snap beans 200 feet long, so apparently the insect was just beginning to emerge. Damage very slight. Examinations on April 12 and 14 gave negative results. First beetle found a week later than in 1938.

Georgia. T. L. Bissell (April 12): One beetle and mass of eggs found on large field of bunch beans at Enigma, south-central Georgia. Beetle had fed on several leaves. Beans in blossom.

Alabama. J. M. Robinson (April 24): Numbers much smaller than ordinarily seen this time, owing possibly to cool weather.

Ohio. H. C. Mason (April): First activity in hibernation cage at Columbus observed on February 28, when 12 beetles out of the 14,600 placed in hibernation were crawling about. Temperature 66° F. Only slight activity at intervals since, although temperature reached 74°, or more, for a period of 4 days in March.

#### BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. L. W. Brannon (April 24): First adult of the season found feeding in the field on young snap beans today at Norfolk. Only one found on four rows of beans 280 feet long. Previous field examinations gave negative results. First beetle found 9 days later than in 1938.

Georgia. T. L. Bissell (April 11-12): No beetles nor evidence of feeding seen in the vicinity of Tifton and Enigma, south-central Georgia. Beans in blossom. One found on cowpea plant at Experiment on April 5. (April 24): Beetles making holes in leaves of young beans at Experiment.

Alabama. J. M. Robinson (April 24): Much less numerous at present than average at this season.

#### BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

South Carolina. J. G. Watts (April 22): Adults observed at Blackville on potatoes, beans, and lettuce since April 7. No damage observed.

Georgia. T. L. Bissell (April 12): One beetle found on beans at Enigma.



PEAS

PEA WEEVIL (Bruchus pisorum L.)

North Carolina. J. S. Pinckney (April 24): First weevils emerging from hibernation quarters swept in a field of Austrian winter peas at Statesville, Iredell County, today.

Oregon. J. C. Chamberlin (April): First general movement from hibernation quarters to pea fields occurred from April 17 to 20 in the Willamette Valley, the earliest general dispersal on record, and nearly a month earlier than in 1938. No peas in bloom except for a few garden plots but all fields now lightly infested.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Florida. H. T. Fernald (April 25): Cabbage butterfly rather more abundant than usual on Cruciferaceae near Orlando.

Kentucky. W. A. Price (April 22): First adults seen on April 8.

Missouri. L. Haseman (April 27): Numerous flights observed at Columbia since the middle of April.

Idaho. J. R. Douglass (April 8): Two specimens collected on laboratory grounds at Twin Falls on April 8, the first noted this season.

Utah. G. F. Knowlton (April 8): Observed in flight at Magna. (April 20): Cabbage butterflies abundant in one field at Logan.

Washington. L. G. Smith (April 17): Adults seen for the first time this season at Pullman.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Utah. G. F. Knowlton (April 20): Moths recently observed as active in several localities in northern and central Utah.

APHIDS (Aphidae)

Virginia. H. G. Walker and L. D. Anderson (April 25): Cabbage aphid rather abundant on seed kale and lightly infesting cabbage plants in some fields at Norfolk.

Georgia. T. L. Bissell (April 24): Cabbage aphids thick on 1 acre of cabbage at Experiment.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Georgia. T. L. Bissell (April 22): One taken per 100 sweeps of net on alfalfa at Experiment.

Alabama. J. M. Robinson (April 24): Present in unusually large numbers.

Texas. R. K. Fletcher (April 21): Reported as causing severe injury to turnip on March 24 at Kerrville, Kerr County; to cabbage and mustard on March 22 at Columbus, Colorado County; and to collards on April 3 at Burton, Washington County.

Iowa. C. J. Drake (April 25): Large shipment of cabbage plants from the South received in Des Moines a few days ago, heavily infested with adults and eggs. Some shipped to Clarinda, Page County, and plants sent from there contained adults and eggs; many plants so badly damaged that it was necessary to discard them.

#### SQUASH

##### SQUASH BUG (Anasa tristis Deg.)

South Carolina. J. G. Watts (April 7): Several adults seen in flight at Blackville.

Utah. G. F. Knowlton and F. C. Harmston (April 5): Adults active.

#### ASPARAGUS

##### ASPARAGUS BEETLE (Crioceris asparagi L.)

South Carolina. J. G. Watts (April): Increasing since the first of the month at Blackville. Eggs plentiful on April 11 and few larvae found on volunteer plants. On April 20 larvae more abundant on voluntary plants and some almost ready to pupate. Present indications are that it may be quite abundant this season.

Utah. G. F. Knowlton (March 28): Adults still in protected places on cool day but present in and around asparagus patches examined at Marriott, Weber County. (April 20): Beetles now active in northern Davis County and southern Weber County. Eggs laid during the last 3 days. Moderate injury to approximately 10 percent of stocks examined in one locality.

Washington. R. S. Lehman (April 18): Reported as doing damage to asparagus at Walla Walla.

C. W. Getzendaner (April): Adults observed in the vicinity of Puyallup on April 14 and present in fair numbers in a field of asparagus at Sumner on April 17, where some tips showed injury. First eggs observed at Puyallup on April 20.

#### ONIONS

##### ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker and L. D. Anderson (April 25): Onions at Norfolk becoming infested.

APHIDS (Aphidae)

Virginia. H. G. Walker and L. D. Anderson (April 25): An aphid has been seriously injuring shallots at Norfolk.

SWEET CORN

CORN EAR WORM (Heliothis armigera Hbn.)

Florida. G. W. Barber (February-March): Normally abundant throughout February and March in the southern part of Dade County. In every planting of corn observed 100 percent of the ears were attacked, averaging about five larvae per ear. Not so much injury to lima bean pods found as in previous years.

FALL ARMYWORM (Laphygma frugiperda A. & S.)

Florida. G. W. Barber (February-March): Found on corn in the southern part of Dade County in about average abundance throughout February and March. Much less numerous than in 1937, somewhat more plentiful than in 1938, and as abundant as in 1936. No plants other than corn attacked. As in previous years, at first they were more abundant in the southern tip of the county, where about 80 percent of corn plants were attacked. Infestation gradually diminished northward to about 20 percent. As the season advanced and the second generation was produced, all cornfields were attacked 100 percent.

STRAWBERRY

STRAWBERRY PAMERA (Orthaea sp.)

Florida. J. R. Watson (April 22): Heavy infestation, mostly O. bilobata Say, in some fields in Alachua County.

A LYGAEID (Paronius longulus Dall.)

Texas. R. K. Fletcher (April 21): Injuring strawberries on March 21 at Cuero, De Witt County.

APHIDS (Aphidae)

California. R. E. Campbell (April 1): Infestations on strawberries in Los Angeles County by an unknown aphid have injured blossoms and caused berries to be deformed.

BLACK VINE WEEVIL (Brachyrhinus sulcatus F.)

Utah. G. F. Knowlton (April 1): Found on strawberry at Logan, Cache County, although no outbreak has occurred.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker and L. D. Anderson (April 25): Still rather abundant and causing considerable damage in strawberry fields at Norfolk.



PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (April 20): Winter survived on last year's pepper plants and now infesting blossom buds on new growth in a field in the San Pedro hills.

BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. G. F. Knowlton (April 20): Moderately abundant on Cheirinia repanda in Tooele County.

APHIDS (Aphididae)

Utah. G. F. Knowlton and F. C. Harnston (April 20): Aphids seriously damaging some sugar beet plants grown for seed in Washington County.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Virginia. S. B. Fenne (April 22): Found generally on April 3 and April 8 at Southside, causing moderate damage.

Florida. F. S. Chamberlin (April 5): Very few found on newly set tobacco in Gadsden County.

Tennessee. L. B. Scott (April 14): Moderately abundant in plant beds in north central Tennessee. Infestation more severe than in 1933.

GARDEN FLEAHOPPER (Halticus citri Ashm.)

Florida. F. S. Chamberlin (April 22): Apparently less abundant than normal on newly set tobacco plants in Gadsden County. (Det. by H. G. Barber.)

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy and C. F. Rainwater (April 22): Some active in cages in Florence County but numbers not increasing, because of cool weather. No cotton far enough advanced to afford food for weevils.

Georgia. P. M. Gilmer and P. A. Glick (April 15): Weevils in cages in Tift, Berrien, Cook, Lowndes, and Echols Counties, southern Georgia, show considerable activity. As high as 1 percent of installation of November 15, 1938, found active on a single day. Movement out of hibernation undoubtedly delayed by cool weather. None taken in the field. So far as spring

emergence is concerned, indications are that infestation will be as heavy as that of last season.

Florida. C. S. Rude and L. C. Fife (April 15): Reported as having been found on cotton in Marion County. Control measures being used by some growers.

Mississippi. E. W. Duggan and J. C. Clark (April 15): Reported as found this week in Washington County during the clearing of new ground.

Louisiana. R. C. Gaines and assistants (April 22): Total weevils taken on field flight screens in Madison Parish for the period from March 25 through April 21 were 16, as compared with 5 for the same period in 1938 and 5 in 1937.

Texas. R. W. Moreland (April 1): Weevils active in cages in Brazos and Burleson Counties, except on March 30. On March 31, 159 weevils were found out of hibernation, the largest number counted during this period. Found in stalk cages, 117; in moss cages in the open, 20; and in woods, 11 found in cages containing leaves and 11 in cages containing moss.

R. L. McGarr (April 15): Three observed on a few plants of stubble cotton examined in a field in Calhoun County on April 12, first record for this season. (April 22): First weevil observed on cotton planted this season in Calhoun County on April 19.

#### A WEEVIL (Chalcodermus collaris Horn)

Florida. C. S. Rude and L. C. Fife (April 22): Taken feeding on the growing tips of cotton in the Sea Island section of Florida. Apparently not doing any serious damage but easily found.

#### PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (April 8): Seven moths emerged from the hibernation experiment at Presidio during the week. (April 22): A total of 670 moths emerged during the week from the hibernation experiment at Presidio, as compared to 109 last week. A total of 529 moths have emerged thus far from larvae overwintering in cotton bolls; 249 moths from larvae overwintering in cocoons; and 26 from larvae overwintering in thurberia bolls. Some emergence from all treatments. Emergence from larvae overwintering in cocoons heavy, as compared with records of previous years.

#### BOLLWORM (Heliothis armigera Hbn.)

Texas. R. W. Moreland (April 8): One egg found on April 5 in examining 500 alfalfa plants, the first found this season in Brazos and Burleson Counties.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. R. K. Fletcher (April 21): Adult taken on April 3 at College Station on primrose.

R. L. McGarr (April 8): First flea hoppers on cotton for this season in Calhoun County noted on April 3, an inspection of 300 plants on this date showing 3 adults and 3 nymphs. Two hundred cotton plants inspected in two other fields on April 8, only 1 nymph being found. (April 15): Two hundred plants in each of 4 fields of cotton in Calhoun County inspected this week, and 2 nymphs recorded in each of 2 of the 4 fields. Emergence of nymphs from the 10 Croton hibernation experiments very light this week, only 2 nymphs recorded, owing no doubt to dry weather prevailing until April 13. (April 22): A total of 1,700 cotton plants inspected in 8 fields in Calhoun County this week averaged 2.5 adults and 0.3 nymphs per 100 plants, an increase of 2.3 per 100 plants over the previous week. Highest number observed on 100 plants this week was 13 adults and 1 nymph. Emergence from 10 Croton cages this week was 12,171 nymphs, as compared with 2 last week. Highest emergence for any day was 6,374 nymphs on April 21, the high emergence being due mostly to rain on April 13.

#### APHIDS (Aphididae)

South Carolina. F. F. Bondy and C. F. Rainwater (April 15): Root aphids found on cotton in Florence County for the first time this week. Common on most weeds. No leaf aphids found. (April 22): Root aphids numerous in cotton in Florence County, Rhopalosiphum sp. being found in larger numbers than others. No leaf aphids.

Texas. R. L. McGarr (April 22): An increase in infestation in most fields observed this week in Calhoun County. High enough in a few fields to cause noticeable damage.

R. K. Fletcher (April 21): Aphis gossypii Glov. found in small numbers on cotton in the two-leaved stage in the Brazos River bottom, Burleson County, on April 19. Not doing damage at present.

#### MOLE CRICKETS (Gryllidae)

Georgia. F. M. Gilmer and P. A. Glick (April 15): Some damage to cotton in sandy fields in Tift, Berrien, Cook, Lowndes, and Echols Counties, especially from mole cricket activity. Fields sporadically scattered and damage most confined to fields of light soils. Damage considerable in small areas with in certain fields.

### FOREST AND SHADE-TREE INSECTS

#### CANKERWORMS (Geometridae)

Vermont. H. L. Bailey (April 28): A few spring canker worm moths had emerged last week.

Pennsylvania. H. E. Hodgkiss (April 19): Eggs of fall and spring cankerworm found on apple. This and other species rather abundant on shade trees throughout the State.



Illinois. W. P. Flint (April 25): Now hatching throughout central and southern Illinois. Very large numbers found on susceptible trees. Damage evidently will be more severe than in 1938.

Missouri. L. Haseman (April 27): Emergence and oviposition began early in April, and hatching of eggs kept in the laboratory for a week began about April 23. No evidence of outdoor hatching or early feeding up to April 26.

Iowa. H. E. Jaques (April 24): Spring cankerworm adults reported as appearing in abundance in Henry, Keokuk, western part of Pottawattamie, and Linn Counties.

#### TENT CATERFILLARS (Malacosoma spp.)

Vermont. H. L. Bailey (April 28): Eggs of forest tent caterpillar (M. disstria Hbn.) observed on some trees at Barre on April 27. No sign of hatching.

Utah. G. F. Knowlton and F. C. Harnston (April 20): Tent caterpillars seriously stripping young leaves from willows, poplars, and other trees and shrubs in several localities in Washington and Kane Counties in southwestern Utah.

Washington. W. W. Baker (April 20): Eggs of M. pluvialis Dyar beginning to hatch on April 7 on fruit trees just north of Vashon, Vashon Island. Eggs quite abundant.

California. S. F. Bailey (April 21): Forest tent caterpillar, M. disstria, together with the apple tree tent caterpillar, M. americana F., is apparently more widespread than in 1938, and together they are causing complete defoliation in Sonoma, Napa, Solano, Yolo, and Colusa Counties, in the Sacramento Valley.

#### GYPSY MOTH (Porthetria dispar L.)

Vermont. H. L. Blaisdell (March 13-18): During the week at Starksboro, Addison County, a single-egg-cluster infestation was found. This is the first to have been found in this town.

Massachusetts. H. L. Blaisdell (March 13-18): Infestation found just off the Mohawk Trail, near the Eastern Summit, in the town of Florida. Although 5 egg clusters found at this colony were creosoted, there still remains further work of extermination to be done. The town is in the barrier zone.

A. F. Burgess (March 20 to 25): Small amount of work done at the infestation found in Florida and three new egg clusters discovered.

Connecticut. A. F. Burgess (March 6-11): Two egg clusters recently discovered at Bethlehem, in the barrier zone. This is the first infestation ever to have been discovered in this town.

#### A SCARABAEID (Anomala binotata Gyll.)

Virginia. S. B. Fenne (April 22): Large numbers of leaf chafers found on various trees in Amelia County, apparently not causing damage.

ELM SCURFY SCALE (Chionaspis americana Johns.)

Tennessee. G. M. Bentley (April 19): Collected on twig at Memphis. (Det. by Morrison.)

Nebraska. M. H. Swenk (April 20): Specimen of infested twig received from Antelope County on March 21.

ASH

BANDED ASH BORER (Neoclytus capreae Say)

Nebraska. M. H. Swenk (April 20): Specimens sent in from Cuming County on April 17.

A CLIMBING CUTWORM (Leuconemis sp.)

Arizona. C. D. Lebert (April 10): At Phoenix these climbing cutworms appear about April 1 every year; hide out in the daytime under the rough bark; and during the night riddle new foliage of ash trees. First observed in 1931 or 1932.

ELDERBERRY

AN APHID (Aphis sambucifoliae Fitch)

Mississippi. C. Lyle (April 21): Specimens feeding on elderberry received from Yazoo City.

OAK

AN OAK LEAF MINER (Buprestidae)

South Carolina. J. G. Watts (April 7): Adult stage observed on post oak at Blackville.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Michigan. E. I. McDaniel (April 19): Several specimens taken from mugho pine in Detroit. Insect quite troublesome on ornamental evergreens in the vicinity of Detroit last year.

A SAWFLY (Neodiprion sertifer Geoff.)

New Jersey. F. A. Soraci (May 1): Eggs had begun hatching at Gladstone on April 29. Eggs plentiful on a small planting of Pinus ponderosa, the first record of occurrence on this pine. Also found on P. resinosa and P. sylvestris. Few eggs found on Austrian pine (P. nigra). Control measures to be used within a few days on the whole forest planting of about 22 acres.

A SAWFLY (Acantholyda erythrocephala L.)

New Jersey. F. A. Soraci (May 1): Adult found on Pinus resinosa at Gladstone on April 29.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Connecticut and New York: E. P. Felt (April 22): Somewhat common in southwestern Connecticut and southeastern New York on Austrian and rugho pines.

Nebraska. M. H. Swenk (April 20): Report from Lincoln County on March 21 of infestation of two 15-year-old spruce trees.

APHIDS (Aphidae)

Connecticut and New York. E. P. Felt (April 22): Eggs of the brown pine aphid (Lachnus sp.) somewhat abundant on needles of Austrian and white pines in southwestern Connecticut and southeastern New York.

Nebraska. M. H. Swenk (April 20): Aphids reported as infesting needles of Scotch pine in Morrill County on March 21.

A NEEDLE MINER (Marmara sp.)

North Carolina. B. H. Wilford (March 31): Some old mines and a few fresh ones observed at Asheville, in small white pines under hardwood cover. Both prepupal larvae and pupae found.

SPRUCE

SPRUCE NEEDLE MINER (Taniva albolineana Kearf.)

Michigan. E. I. McDaniel (April 19): Reported from Ypsilanti, where spruce trees 15 feet high and over are badly infested.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

Michigan. R. Hutson (April 22): Mites observed on spruce at South Haven, Grand Rapids, Kalamazoo, and Detroit.

I N S E C T S   A F F E C T I N G   G R E E N H O U S E

A N D   O R N A M E N T A L   P L A N T S

GREEN JUNE BEETLE (Cotinis nitida L.)

Tennessee. L. B. Scott (April 14): Normally abundant in Montgomery County, north-central Tennessee. Damage to lawns is from moderate to severe.



ONION THRIPS (Thrips tabaci Lind.)

New York. F. S. Blanton (January 14): Severe loss caused to Gerbera in greenhouses at Babylon, Long Island. Flowers ruined by feeding. (Det. by F. Andre.)

FLOWER THRIPS (Frankliniella tritici Fitch)

South Carolina. J. G. Watts (April): Attacking various wild and cultivated flowers at Blackville.

A PLANT BUG (Euryophthalmus convivus Stal)

California. C. K. Fisher (April 13): Bordered plant bugs have been observed on warm days all winter and are now very numerous in one section of the city of Fresno. They are attacking the new growth on summer lilac (Buddleia) and loganberry vines.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum Westw.)

Tennessee. G. M. Bentley (April 19): Whitefly reported in greenhouses where control measures not used.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

South Carolina. J. G. Watts (March and April): An infestation of this scale has been causing considerable damage to garden shrubbery for the last 2 years at Blackville.

CYCLAMEN MITE (Tarsonemus pallidus Banks)

Pennsylvania. E. P. Felt (April 22): Reported as quite injurious to Godetia sp. in a greenhouse in the Philadelphia area.

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

New York. E. P. Felt (April 22): Reported as abundant near Waternill, Long Island.

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Florida. J. R. Watson (April 22): Sent in from Alachua and other counties in northern Florida.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

Massachusetts. E. P. Felt (April 22): Moderately abundant in boxwood at Hatchville. The boxwood had been submerged by the storm tide of last September and the mined areas were suggestive of fungus infection.

Virginia. C. R. Willey (April 22): Practically 100-percent pupated at Richmond on April 20.

CHRYSANTHEMUM

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

Mississippi. E. W. Dunnam (April 15): Causing slight damage to chrysanthemum buds in Leland.

Oklahoma. F. A. Fenton (April 21): Reported from Stillwater and Fairfax.

CHRYSANTHEMUM LACEBUG (Corythucha marmorata Uhl.)

Mississippi. E. W. Dunnam (April 15): Doing serious damage to chrysanthemums in Leland.

THRIPS (Thysanoptera)

Tennessee. G. M. Bentley (April 19): Thrips reported on chrysanthemum and causing some damage where control measures have not been used.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Const.)

Pennsylvania. E. P. Felt (April 22): Moderately abundant on euonymus in the Philadelphia area.

Mississippi. C. Lyle (April 21): Specimens received from Brookhaven.

GARDENIA

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Virginia. H. G. Walker and L. D. Anderson (April 25): Many requests received from Norfolk for information on the control on gardenias.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (April 20): Numerous complaints received of this thrips on gladiolus.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicis Curt.)

Virginia. C. R. Willey (April 22): Very abundant in Richmond and vicinity. Emergence of adults began between April 15 and 18. None found to have emerged on heavily infested tree on April 15; empty pupal cases found on April 18; and first flies seen on April 19.

JUNIPER

JUNIPER WEBWORM (Dichomerus marginella F.)

New Jersey. H. C. Donohoe (April 13): A planting of junipers at White Horse shows severe defoliation from 1938 attack. In a cursory examination of debris in the crown of 1 3-foot plant, 44 hibernating webworms were noted.

Maryland. E. N. Cory (April 11): Attacking Irish juniper at Baltimore.

Virginia. C. R. Willey (April 22): Very abundant on Irish and Swedish juniper in Richmond. First pupa found on April 21.

AN APHID (Lachnus sabinae Gill.)

Virginia. A. M. Woodside (April 22): Some heavy infestations of a large, dark red aphid, probably L. sabinae, observed on Irish juniper in Staunton.

LILY AND NARCISSUS

BULB MITE (Rhizoglyphus hyacinthi Bdv.)

Mississippi. C. Lyle (April 21): Infested bulbs received from Newton on April 21.

Nebraska. M. H. Swenk (April 20): Lily plant from Dodge County found to be infested on March 31.

A NOCTUID (Xanthopastis tinais Cram.)

Georgia. C. A. Weigel (April 20): Specimens feeding on narcissus at Savannah April 12. (Det. by C. Heinrich.)

Mississippi. C. Lyle (April 21): Larvae found feeding on lilies growing wild near State College.

LILAC

LILAC BORER (Podosesia syringae Harr.)

Michigan. R. Hutson (April 22): Prevalent at Farmington.

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

Louisiana. T. E. Snyder (April 20): Magnolia soft scale injurious to ornamental deciduous magnolia trees on lawns in New Orleans. Branches killed.

A SCALE (Toumeyella turgida Ckll.)

Mississippi. C. Lyle (April 21): Specimens received from Forrest, Marion, and Pike Counties. Found infesting Michelia fuscata.



NINEBARK

AN APHID (Myzus sp.)

New Jersey. M. D. Leonard (March 11): Aphids from leaves of ninebark, Physocarpus opulifolius, at Ridgewood. (Det. by P. W. Mason.)

OLEANDER

OLEANDER SCALE (Aspidiotus hederæ Vallot)

Mississippi. C. Lyle (April 21): Oleander leaves infested with this scale received from West Point on April 3.

ORCHID

A STEM MINER (Agromyza virens Loew)

Florida. G. W. Barber (April 18): Several specimens received of a small fly, the larvae of which feed in the flower stems of an orchid, native to the extreme southern part of the Everglades. A collector of native orchids states that, both in his nursery at Homestead and in the wild, this fly is so abundant that very few blossoms of this orchid survive. According to him the orchid is being destroyed in the wild since it is unable to produce seed. This condition has been observed only recently. (Det. by C. T. Greene.)

RHODODENDRON

RHODODENDRON BORER (Conopia rhododendri Beutm.)

Pennsylvania. E. P. Felt (April 22): Observed in small numbers in the Philadelphia area.

AN AMBROSIA BEETLE (Corthylus punctatissimus Zimm.)

New York. E. P. Felt (April 22): Pitted ambrosia beetle moderately numerous in a rhododendron planting at White Plains.

ROSE

ROSE SAWFLY (Caliroa aethiops F.)

Virginia. C. R. Willey (April 22): First signs of oviposition found at Richmond on April 15.

THRIPS (Thysanoptera)

Florida. J. R. Watson (April 22): Numerous complaints received of Frankliniella cephalica Crawford on roses.

Mississippi. C. Lyle (April 21): Specimens of thrips on rose received from Bay St. Louis, Hancock County, on April 10.

ROSE APHID (Macrosiphum rosae L.)

South Carolina. J. G. Watts (April 14): Aphids, probably this species, very abundant on rose blossoms at Blackville. Apparently responsible for the blossoms failing to open.

Mississippi. E. W. Dunnam (April 10): Green aphids very numerous on rose buds in Leland.

ROSE WIDGE (Dasyneura rhodophaga Coq.)

Michigan. E. I. McDaniel (April 19): Reported from a Lansing greenhouse, where for the first time in a number of years, it is causing considerable loss.

STRAWBERRY LEAF-CHAFER (Diplotaxis frondicola Say)

Mississippi. C. Lyle (April 21): Adults of this leaf feeder sent in early in April from Laurel and Lucedale, with information that they were feeding on rose and other plants.

SNOWBALL

SNOWBALL APHID (Aphis viburnicola Gill.)

New Jersey. M. D. Leonard (April 9): Stem mothers just starting to hatch from overwintering eggs, which were fairly common on a large snowball bush at Haddonfield.

INSECTS ATTACKING MAN AND

DOMESTIC ANIMALS .

MAN

FLEAS (Siphonaptera)

General. E. C. Cushing (April 25): Fleas resuming activities out of doors, according to reports from suburban District of Columbia and nearby Maryland and Virginia. Increasing abundance first noted around April 1. Specimens determined as Ctenocephalides felis Bouche, C. canis Curt., and Fulex irritans L. (Det. by Helen L. Trembley.)

BEDBUG (Cimex lectularius L.)

Nebraska. M. H. Swenk (April 20): Reported on March 29 as infesting a house in Hall County.

Oklahoma. F. A. Fenton (April 21): Reported from Oklahoma City.

## MOSQUITOES (Culicinae)

Utah. G. F. Knowlton (April 20): Mosquitoes reported as appearing in northern Utah.

Oregon. H. H. Stage (March and April): First larvae of Theobaldia incidens Thoms. observed in artificial containers at Portland on March 28. Third-instar larvae of Aedes vexans Meig. taken at Portland on April 7. Not associated with flood-water conditions but in rain pools. (April 14): First larvae of Anopheles maculipennis Meig., A. punctipennis Say, and Culex tarsalis Coq. found in Multnomah County during the last few days.

## TROPICAL RAT MITE (Liponyssus bacoti Hirst)

California. H. J. Ryan (April 14): Reported on persons at Hollywood and Los Angeles on March 30. (Det. by H. H. Keifer.)

## ROCKY MOUNTAIN SPOTTED FEVER TICK (Dermacentor andersoni Stiles)

Idaho. J. R. Douglass (April 8): Reported from the Snake River Plains that this tick is very numerous in southern Idaho this spring.

## AMERICAN DOG TICK (Dermacentor variabilis Say)

Delaware. E. C. Cushing (April 25): On April 24, two specimens were received from Harbeson, where they were found on a man's clothing. (Det. by Helen L. Trembley.)

Maryland and Virginia. E. C. Cushing (April 25): Reports received since the first week of April relative to occurrence of this tick in Maryland and Virginia near Washington, D. C. (Det. by Helen L. Trembley.)

Tennessee. E. C. Cushing (April 25): Specimens received from around Knoxville. Collected since April 8. (Det. by Helen L. Trembley.)

Georgia. A. L. Brody and E. E. Rogers (April): On April 6 one male and one female were removed from sheep at Valdosta. More ticks of this species removed from sheep at Valdosta on April 13.

## CATTLE

### BITING MIDGES (Simuliidae)

Tennessee. G. M. Bentley (April 19): Reported on April 9 as causing considerable damage in counties in western Tennessee, where water has been high. Some livestock killed and control measures being used by farmers.

Utah. G. F. Knowlton (April 22): Biting midges very annoying to man; females (Simulium sp.) abundant at lights in northern Utah.

## SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody and E. E. Rogers (April 20): Infestations on cows at Valdosta



were reported on March 25 and April 7, and one on a hog on April 13.

Florida. F. S. Chamberlin (April 20): Reports from stock raisers in Gadsden County indicate that screwworm (Cochliomyia sp.) is abundant at present.

Texas. D. C. Farman (April 25): A very low population in the area from Uvalde to the Devil's River up to April 15, approximately 25 percent of last year's infestation. Center of infestation apparently in the Brackettville district, and only 4 screwworms taken in the trap there in the period ending April 15. The only traps taking C. americana during the year up to April 15 were at Uvalde, Camp Wood, Brackettville, and Castle Canyon, none having taken more than 10 flies per trapping period during that time. None taken in traps at Langtry, Sanderson, Fort Stockton, McCamey, Sheffield, Ozona, Junction, San Saba, or Llano this year. No adults taken in the Frederickburg trap since last October, nor in the De Hanis trap since September 19. Light infestation present in the lower Rio Grande and Gulf coast areas. the trapping period ended March 31, 81 adults were taken at Alice; 72 at San Perlita; 39 at Encino; 20 at Laredo; 10 at Sinton; and 4 at Catarina. No adults taken at San Marcos, Cuero, or Victoria.

#### A CATTLE GRUB (Hypoderma sp.)

Iowa. H. E. Jaques (April 24): Report of an unusual infestation of ox warble cattle in Hardin County.

#### SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus Nitz.)

Texas. O. G. Babcock (April 25): On April 17 the short-nosed ox louse showed on several ranches at Sonora, the first year this louse has been observed that far south by the reporter.

#### TICKS (Amblyomma spp.)

Georgia. A. L. Brody and E. E. Rogers (April 20): At Valdosta Gulf coast ticks (A. maculatum Koch) were removed from the ears of sheep on April 6 and 13.

Mississippi. C. Lyle (April 21): Specimens of A. americanum L. sent in on April 12 from Jones County.

#### POULTRY

##### FOWL TICK (Argas miniatus Koch)

Oklahoma. F. A. Fenton (April 21): Reported from Purcell, in the south-central part of the State.

#### SWINE

##### HOG LOUSE (Haematopinus suis L.)

South Carolina. J. G. Watts (April): Abundant on hogs at one farm near Blackville for 2 years. Several apparently successful clean-ups of the adults have been made during this period but the population builds up again within a few months.

MISCELLANEOUS ANIMALS

A MITE (Ptilonyssus sp.)

New Jersey. E. C. Cushing (April 25): Mites taken from the tracheae of canaries on March 15. Mite found in about two-thirds of the birds autopsied after a lung illness at a commercial canary company at Denville, N. J. (Det. by H. E. Ewing.)

A SUCKING DOG LOUSE (Linognathus setosus Olfers)

Connecticut. G. H. Plumb (March 23): Adults and nits very abundant on dog at New Haven; some dead adults and nits in baby's crib. Puppy ordinarily allowed to play in crib with baby.

RABBIT TICK (Haemaphysalis leporis-palustris Pack.)

Georgia. (April 20): Fully engorged and partly engorged ticks removed from ears and body of a swamp rabbit on April 10 at Valdosta.

BLACK-LEGGED TICK (Ixodes ricinus scapularis Say)

Georgia. A. L. Brody and E. E. Rogers (April 20): Engorged females removed from a sheep at Valdosta on April 6.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Isoptera)

Connecticut. N. Turner (April 19): Flights of Reticulitermes flavipes Kollar have occurred for the last month in the usual numbers. Many modern buildings seriously damaged.

Pennsylvania. H. E. Hodgkiss (April 19): Termites reported as giving considerable trouble in Philadelphia and Delaware Counties, and a number of requests for assistance received from the Pittsburgh area, the result of winged individuals being noticed. Record made on March 30 in the southeastern part of the State.

New Jersey. J. C. Silver (April 15): Requests for identification and control of termites (R. flavipes) sent in daily from Bergen, Hudson, and Essex Counties, northern New Jersey, since March 27, the date of the first migration brought to our attention this year.

Delaware. L. A. Stearns (April 3): Termites reported as infesting a church at Newark. Extensive repairs necessary.

Maryland. E. N. Cory (April 24): Infesting houses in Baltimore, Cecil, and Prince Georges Counties.

North Carolina. Z. P. Metcalf (April 27): Termites infesting house in Durham.

D. L. Wray (April 19): A heavy infestation of R. flavipes found doing considerable damage to English laurel at Greensboro. Most of the plants previously damaged by peach borer (Conopia exitiosa Say).

Tennessee. L. B. Scott (April 14): Many swarms of termites reported late in March and early in April in Montgomery County, north-central Tennessee, in normal abundance.

Ohio. T. H. Parks (April 24): Complaints submitted almost daily of termite trouble in houses. Abundance normal.

Michigan. E. I. McDaniel (April 19): Termite flights recorded from Baroda, Grand Haven, Grass Lake, Grand Rapids, Jackson, and Hillsdale.

Missouri. A. C. Burrill (April 3): Despite 2 to 6 years of drought and of control treatments, the Jefferson City area is heavily infested every year with R. flavipes.

Nebraska. M. H. Swenk (April 20): R. tibialis Banks reported as attacking rhubarb leaves in Nuckolls County on April 17, and found damaging a lily plant in Dodge County on March 29. House in Douglas County reported as infested on April 9.

Oklahoma. F. A. Fenton (April 21): Termites, probably R. flavipes, reported in Geary, Shawnee, Oklahoma City, Walter, and McLoud.

Iowa. C. J. Drake (April 25): Letters regarding termite injury to wood received from Mystic, Boone, Mason City, Red Oak, Ottumwa, Ogden, and Rockwell City. At Ogden examination of an infested residence revealed many of the timbers almost entirely destroyed.

Utah. J. C. Hamlin (March 29): Termite injury to residential property in Salt Lake City reported in March by several persons.

Nevada. G. G. Schweis (April 24): Subterranean termites reported as infesting several residences in Reno.

Washington. M. H. Hatch (April 6): Zootermopsis angusticollis Hagen reported as injuring the wooden structure of a residence in Olympia.

#### ANTS (Formicidae)

Connecticut. N. Turner (March 27): Paratrechina longicornis Latr. generally prevalent in a large hotel at New Haven. (Det. by M. R. Smith.)

Florida. G. B. Merrill (April 18): Specimens of Wasmannia auropunctata Roger taken at Apopka and Winter Garden, central Florida. (Det. by M. R. Smith.)

Mississippi. C. Lyle (April 21): Specimens of Argentine ant (Iridomyrmex humilis Mayr) received on March 28 from a farm in Yazoo County. Specimens of the fire ant Solenopsis xyloni McCook received from Noxubee, Clay, and Sunflower Counties, and reports from Leflore County as causing injury in gardens and houses.



Missouri. A. C. Burrill (April 17): A regular trail of Prenolepis imparis Say observed at Jefferson City, Cole County, in wet, very cold weather. Occasionally Crematogaster lineolata Say bores the pith area of elderberry for a succursal nest.

Nebraska. M. H. Swenk (April 20): Report received from Adams County on April 11 indicated that ants were infesting a house. Specimens of Camponotus fallax Nyl. brought in from Hamilton County on April 7. Reported as infesting a house.

FIELD CRICKET (Gryllus assimilis F.)

Nebraska. M. H. Swenk (April 21): Reported as annoying in a dwelling in Polk County on March 22.

ORIENTAL COCKROACH (Blatta orientalis L.)

Connecticut. N. Turner (April 19): Becoming more abundant in Connecticut. About 50 specimens received from a small store in Bridgeport.

BOXELDER BUG (Leptocoris trivittatus Say)

T. H. Parks (April 24): Specimens received in March from Mercer, Anclize, and Butler Counties, all near the western border of the State, with the statement that they were found in houses.

Michigan. E. I. McDaniel (April 19): Abundant in the vicinity of Ypsilanti. In some places observed swarming into houses and giving considerable trouble.

Iowa. C. J. Drake (April 25): Very abundant this spring. Reports received from Council Bluffs, Centerville, Adel, and Gifford.

Nebraska. M. H. Swenk (April 20): Complaints of annoyance received from March 21 to April 20, chiefly from Boyd, Knox, Madison, Polk, Colfax, Buffalo, York, Lancaster, Gage, and Douglas Counties.

Utah. J. C. Hamlin (March 29): Bugs have emerged from hibernation with the advent of warm weather in March and have begun troubling householders in Salt Lake City.

SPIDER BEETLES (Ptinus spp.)

Utah. G. F. Knowlton (March 31): Specimens sent in from Tooele, Tooele County; considered injurious. (Det. by W. S. Fisher.)

Washington. M. H. Hatch (April 10): Specimens of Ptinus tectus Boieldieu reported as infesting a residence in the Magnolia Bluff district of Seattle.

POWDER-POST BEETLES (Lyctus spp.)

New Jersey. R. A. St. George (April 5): Two reports of planicollis Lec. as attacking newly erected residences at Waldwick sent in on March 27. Some boards so badly infested that new floors had to be laid.

Maryland. E. N. Corv (April 12): L. planicollis reported in a house in Baltimore (Det. by W. S. Fisher.)

California. P. Simmons (April 5): Emergence holes of L. cavicollis reported appearing in several areas of an oak floor laid 2 years ago at Fresno. A few holes apparent a year ago; now several dozen holes in the boards. (Det. by W. S. Fisher.)

A CERAMBYCID (Chlorophorus annularis F.)

Michigan. R. A. St. George (April 3): Infested bamboo rake handles sent in from southwestern Grand Rapids on October 24, 1933. Three adults reared. (Det. by W. S. Fisher.)

TULE BEETLE (Agonum maculicolle Dej.)

California. P. Simmons (April 4): Specimens received from Avenal, a new town in Kings County, near the Kettleman Hills oil field, with statement that homes are being invaded nightly. This insect usually causes trouble in fall, the present instance being the first spring movement into homes that has come to our attention.

A WHARF BORER (Nacerda melanura L.)

New Jersey (March): Considerable untreated piling damaged above the highwater mark by the wharf borer, at the south end of Staten Island on the Arthur Kill River.

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BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
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AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING











POPULATIONS AND HOST PREFERENCES OF JUNE BEETLES  
IN SOUTHERN WISCONSIN IN 1938By T. R. Chamberlin, C. L. Fluke, Lee Seaton, and J. A. Callenbach<sup>1/</sup>

## INTRODUCTION

The study of the flight and host preferences of June beetles of southern Wisconsin, which was initiated at the University of Wisconsin in 1935 and continued in 1936 and 1937, was also continued in 1938, a year of flight for the "A Brood," or major brood of beetles. The methods of investigation adopted were essentially the same as those of 1935, 1936, and 1937. These studies were reported in the Insect Pest Survey Bulletin, June 15, 1938 (supplement to No. 4, vol. 18). The purposes of this work are also discussed there.

The populations and host preferences of the various species of beetles were obtained by hand picking large numbers of beetles from the host plants on which they were feeding at night and determining the percentage of the total number of beetles of each species taken from each kind of plant. Some samples were taken from trees on which many beetles were concentrated by shaking branches over canvas, but such samples are not included in the data herein presented.

Many of the groves in which flight observations were made in 1938 were the same as those used in previous years; however, for various reasons, some of these had to be abandoned and others in the same neighborhood substituted. A few new localities were also selected. These groves were distributed over the southern part of the State between Racine on the east, Wyalusing on the west, Hancock on the north, and Lamont on the south (fig. 1). The plant complex differed in the various localities to a greater or less extent. In selecting these groves the same plan was followed as formerly, that is, to choose only such groves as contained the maximum number of the kinds of shrubs and trees that were general in the locality.

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<sup>1/</sup> Callenbach made the observations at Gays Mills, Boscobel, and Wyalusing; Chamberlin, Fluke, and Seaton the observations in all other localities. This project is part of the general program for investigation of June beetles and white grubs being conducted cooperatively by the Bureau of Entomology and Plant Quarantine, of the United States Department of Agriculture, and the Wisconsin Agricultural Experiment Station through its Department of Economic Entomology.

Usually collections were made by from 2 to 4 collectors between 7:30 and 11:30 p.m., although later in the season the flight might not begin until about 8:20 p.m. Sometimes, when small flights had occurred, the plants were well covered by the collectors before 11:30 p.m. A total of 71 collections were made from 25 groves between April 26 and July 29. Very few beetles were found late in June in other than the Gays Mills area and no collections were made after July 1, except at Gays Mills. The location of the groves and the number of collections made in each were as follows: Dane County--Dane, 5 collections; Waunakee, 1; Oregon, 1; Blue Mounds, 4; Columbia County--Lodi (Camp Perry), 3; Leeds, 4; Poynette, 2; Walworth County--Whitewater, 1; Racine County--Racine, 1; Kenosha County--Kenosha, 1; Fond du Lac County--Ripon, 1; Waushara County--Hancock, 1; Lafayette County--<sup>2</sup>Ligon, 6 in 2 groves; Iowa County--Linden, 3; Rock County--Edgerton, 4; Grant County, Boscobel, 2 in 2 groves, Wyalusing, 1; Crawford County--Gays Mills, 16 in 1 grove and 14 in 5 other nearby groves. Figure 1 shows these localities.

The Gays Mills area which was studied most intensively differed from the other areas mainly in the absence of bur oak, the scarcity of Phyllophaga hirticula (Knoch) and predominance of P. rugosa (Melsh.). To include the collections from this area with those from other parts of the State would bias the averages on which the relative populations of the various species throughout the southern part of the State are based. For this reason, the collections from the Gays Mills area are, for the most part, considered separately from the others.

#### Number of Beetles and Species Collected

A total of 24,219 beetles, belonging to 18 determined and 1 undetermined species, were taken. Although this number exceeds slightly the total collected in the previous 3 years, the beetles did not seem so numerous as in 1935 (the previous flight of "A Brood"), except in Lafayette and Iowa Counties, where Phyllophaga hirticula Knoch was very abundant. Of the 24,219 beetles, 9,759, or 40.29 percent, were P. rugosa (Melsh.); 6,702, or 27.67 percent were P. hirticula; 4,845, or 20.00 percent, were P. fusca (Froel.); and 738, or 3.05 percent, were P. prunina (Lec.). Collectively, these 4 species comprised 91.02 percent of the beetles collected. The first 3 of these species were most abundant, in the same order, in 1935 but in that year P. tristis (F.), rather than P. prunina was fourth. Of species having a 3-year life-cycle, the same 3 species have been most abundant each year since 1935, inclusive, except in 1936, when P. hirticula was rare. In 1936 P. tristis, which has a 2-year cycle, was extremely abundant and greatly exceeded all other species in numbers. Because of this high population in 1936, a heavy flight of this species would have been expected in 1938, but field diggings had shown that P. tristis had laid very few eggs in the extremely dry soils of that year and very few grubs of that brood were found in the years following. Table 1 shows the numbers of beetles of each species taken and the percentage of the total comprised by each.

<sup>2</sup>/ In this case the grove was a short distance northwest of Edgerton in Dane County.



# Beetles Collected in Other Than the Gays Mills Area

Outside the Gays Mills area, between April 27 and June 30, 16,468 beetles were taken in 41 collections from 16 groves. The predominant species were P. hirticula, P. rugosa, and P. fusca. These furnished 40.13, 24.16, and 20.77 percent, respectively, of the total beetles, collectively 85.06 percent. P. hirticula was very abundant in Lafayette and Iowa Counties, where it represented about 90 percent of all beetles taken in each collection. Not a single specimen of P. rugosa was taken at Lamont, the collection area for Lafayette County, and only 3 at Linden, the collection area for Iowa County. P. fusca was rather generally distributed. P. prunina was collected almost entirely from sandy areas near Lodi, Poynette, and Boscobel. The number of all beetles taken and the proportion of the total represented by each are shown in the "totals" line of table 2. The lower of the 2 percentages in each space is the one that applies in this case.

## Beetles Collected in the Gays Mills Area

In the Gays Mills area 30 collections were made between April 26 and July 29. These included 16 collections from the regular grove in and adjoining the sample pasture in which grub populations and species have been studied for several years past and 14 from 5 groves within a mile of the sample pasture which, for the most part, consisted of shrubs in or adjoining apple or cherry orchards. The grove adjoining the sample pasture included about 10 cherry trees in an adjacent commercial planting.

Table 1.--Relative abundance of various species of beetles collected in 1938

Species	Beetles	
	Number	Percentage of total
<u>P. rugosa</u> (Melsh.)-----	9,759	40.29
<u>P. hirticula</u> (Knoch)-----	6,702	27.67
<u>P. fusca</u> (Froel.)-----	4,845	20.00
<u>P. prunina</u> (Lec.)-----	738	3.05
<u>P. implicita</u> (Horn)-----	597	2.47
<u>P. tristis</u> (F.)-----	502	2.07
<u>P. balia</u> (Say)-----	269	1.11
<u>P. drakei</u> (Kby.)-----	246	1.02
<u>P. ilicis</u> (Knoch)-----	211	.87
<u>P. futilis</u> (Lec.)-----	135	.55
<u>P. nitida</u> (Lec.)-----	117	.48
<u>P. crenulata</u> (Froel.)-----	39	.16
<u>P. marginalis</u> (Lec.)-----	18	.07
<u>P. anxia</u> (Lec.)-----	18	.07
<u>P. spreta</u> (Horn)-----	10	.04
<u>P. inversa</u> (Horn)-----	7	.03
<u>P. villifrons</u> (Lec.)-----	2	.01
<u>P. forsteri</u> (Burm.)-----	3	.01
<u>P. sp.</u> -----	3	.01
Total-----	24,221	99.98



A total of 7,751 beetles were taken. Of these P. rugosa comprised 74.58 percent, P. fusca 18.38 percent, P. balia 2.59 percent, and P. ilicis 2.44 percent. Together these species supplied 97.99 percent of the total. The number of beetles of each species taken and the proportion of the total each species represents are shown in the "total" line at the bottom of table 3. It may be noted that P. hirticula was scarce in this area, as was P. rugosa in Lafayette and Iowa Counties.

#### Host Preferences of the Beetles outside the Gays Mills Area

Table 2 gives a complete list of the kinds of host plants from which collections were made in the southern part of the State, excluding the Gays Mills area, and the numbers of beetles of each species taken from each kind of plant. These tables are identical in form with those which appeared previously in Supplement to Number 4, Volume 18, of the Insect Pest Survey Bulletin. There are 3 entries in each space consisting of 2 percentages and a number. The percentage at the top represents the proportion of the species of beetles appearing at the top of the column, which were taken from the host plant at the left, and the lower percentage represents the proportion of the total beetles collected from the host mentioned at the left, representing the species at the top of the column. The middle number in each group of figures represents the number of beetles of the species mentioned at the head of the column, collected from the host plant mentioned at the left. Thus 3,520 P. hirticula were taken from hazel. These represented 53.27 percent of the total beetles of this species and 76.71 percent of the total beetles of all species taken from hazel.

P. hirticula was taken from 27 kinds of plants. Hazel, bur oak, hickory, and aspen supplied 53.27, 21.87, 4.96, and 4.71 percent of the total number of beetles and together 84.81 percent of the total for this species.

P. rugosa was collected from 31 kinds of plants. Aspen, red oak (group), hazel, hickory, willow, dogwood, and bur oak supplied 17.22, 16.97, 11.44, 10.26, 8.04, and 7.89 percent of the total number of beetles, respectively, and together 80.03 percent of the total for this species. It is apparent that P. rugosa is more diversified in its feeding habits than is P. hirticula.

P. fusca was taken from 26 kinds of plants. Dogwood, red oak (group), bur oak, aspen, and hazel supplied 35.15, 19.47, 10.12, 8.57, and 8.07 percent of the total, respectively, and together 81.38 percent of the total for this species.

P. prunina was taken from 13 kinds of plants. Of these oaks of the red oak group and hazel supplied 81.03 and 10.84 percent, respectively. Preferred hosts of the other species of beetles may be found in table 2.

#### Host Preferences of the Beetles in the Gays Mills Area

Host preferences of the various species of beetles in the Gays Mills area are shown in table 3, which is identical in form with table 2. The most abundant species, P. rugosa, was found on 29 kinds of plants, cultivated

Table 2.--Beetles Collected in Southern Wisconsin Outside of Cays Millc Area, 1938

[illegible]





Table 3.--Beetles Collected in Gays Mills Area, 1938.

[illegible]



cherry, butternut, hazel, hickory, basswood, and ironwood supplying 22.56, 21.95, 14.58, 12.32, 5.62, and 4.60 percent of the total, respectively, and collectively 81.63 percent of the total for this species.

P. fusca was collected from 22 kinds of host plants. Butternut, wild plum, cultivated cherry, hickory, ironwood, and dogwood supplied 25.33, 19.30, 17.75, 14.88, 14.00, and 5.12 percent of the total, respectively, and together 96.38 percent of the total for this species.

P. balia was found on 13 kinds of host plants. Hickory, butternut, hazel, red oak (group), wild plum, and ironwood supplied 35.82, 15.42, 13.43, 7.46, 6.97, and 6.47 percent of the total, respectively, and together these 6 hosts supplied 85.57 percent of the total for this species.

P. ilicis was collected from 16 kinds of plants. Hazel, butternut, hickory, wild plum, and ironwood supplied 33.33, 24.34, 11.64, 6.88, and 4.23 percent of the total, respectively, and together 80.42 percent of the total for this species. The various hosts of the less abundant species are given in table 3.

#### Flight Habits of the Beetles

In general, observations on the flight habits of June beetles in 1938 were in agreement with those made in previous years. P. fusca and P. tristis emerged earlier in the season and at lower temperatures than did the others, but P. tristis was rare and no close check could be kept on the conditions that governed its emergence. In the case of P. fusca, however, comparisons were made of its seasonal and temperature reactions with several other common species. P. tristis is not considered in the following discussion, but its relative population is indicated on some of the charts.

P. fusca, in addition to issuing earliest in the season, was most numerous for some weeks after its initial emergence, whether temperatures were low or high. At Dane on the night of April 27, when the air temperature was 71° F. and the soil temperature just below the surface 67°, the beetles caught were almost exclusively P. fusca and the flight was of fair size. Essentially the same conditions prevailed on May 2, but P. rugosa and P. balia were then appearing.

Later in the season the effect of temperature on the emergence of different species was more clearly shown. In some areas, by May 2, species other than P. fusca predominated when the temperatures were high enough, but when temperatures were below approximately 55° F. the proportion of P. fusca beetles increased. At Dane on May 23, when the air temperature was 51° and the soil temperature 59° the beetles were mostly P. fusca; at Leeds on May 13, when the air temperature was 48°, the beetles were exclusively P. fusca; but at Dane on June 2, with the air temperature at 64°, both P. rugosa and P. hirticula were about five times as numerous as P. fusca; and at Leeds on June 13, with the air temperature at 62°, P. rugosa again was about five times as numerous as P. fusca.



P. fusca does not persist in the fields in any numbers as late in the season as some of the other species, especially P. rugosa, and some of the decline in the proportion of the total comprised by this species late in the season was caused by the slow decrease in numbers in the field. That the temperature, however, is of importance in determining the extent to which this species emerges is shown in figures 2, 3, and 4, in which the percentage of the total beetles represented by each species is shown for different localities and on various dates, together with the air temperatures prevailing at the beginning of the flight. To avoid error in interpreting these charts one should bear in mind that no indication is given on them of the actual numbers of beetles taken, and that P. fusca predominated earlier in the season and P. rugosa and P. hirticula later.

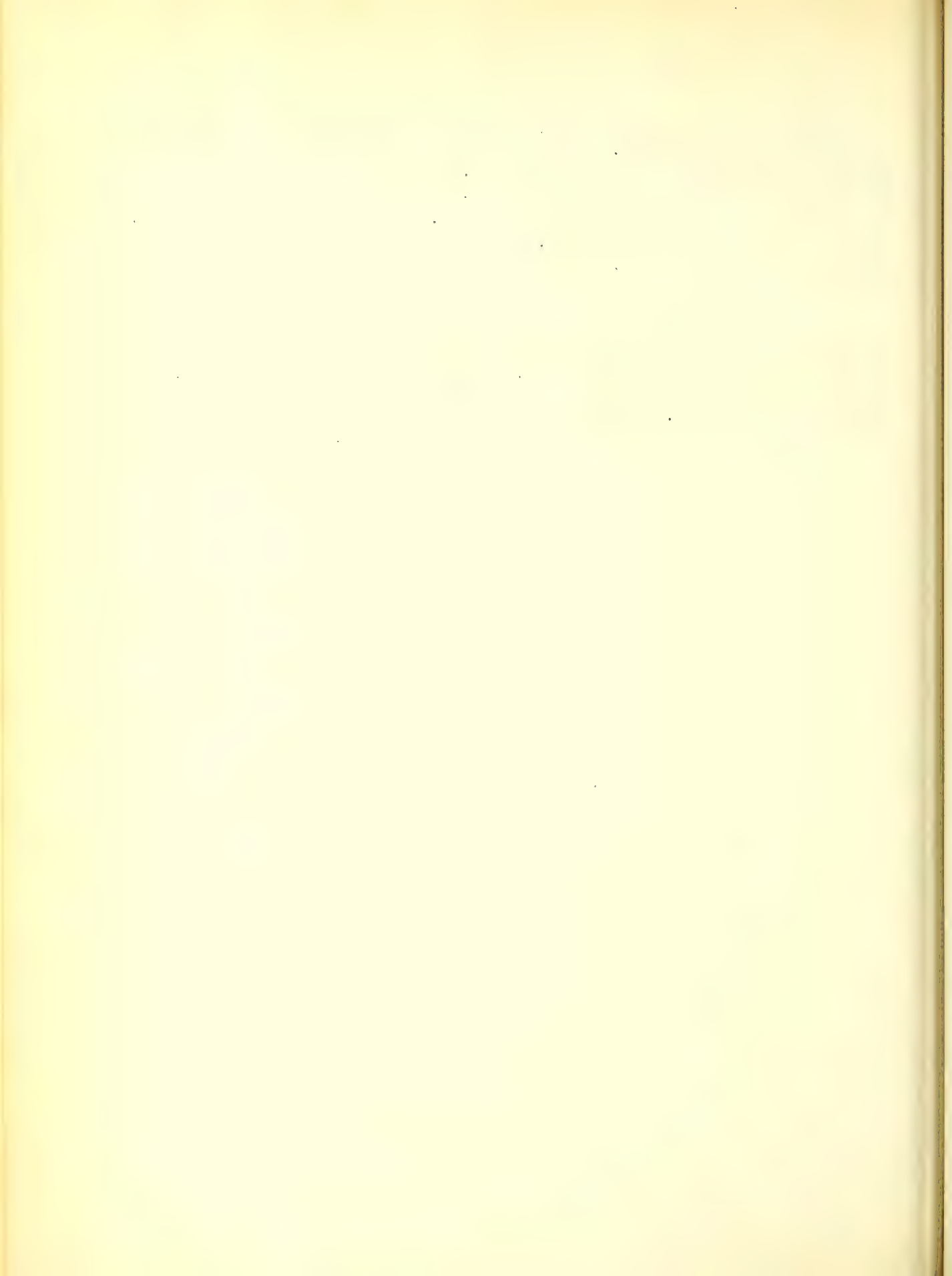
The chart for the Gays Mills grove (fig. 4) shows best the direct effect of temperature on emergence. Both P. fusca and P. rugosa are common in this area. It may be noted from this chart that on April 26, with an air temperature of 73° F., over 90 percent of the beetles were P. fusca. This was probably because none of the other species had begun to emerge by that date. By May 2, when the temperature was still high and P. rugosa had begun to emerge, most of the beetles were P. rugosa; however, on May 10, when the temperature was 54°, about 60 percent of the beetles were P. fusca and by May 12, when the temperature was 54°, this species had increased to almost 90 percent. When the temperature rose to 61° on May 16, the positions of the two species became again reversed, after which temperatures remained high and P. fusca beetles were always in the minority. This chart also shows that P. ilicis emerges late in the season and does not become abundant until considerably after its initial emergence.

Figure 2 shows the temperature and seasonal relationships at the Dane grove, where P. fusca, P. rugosa, and P. hirticula are common. Early in the season, although temperatures were high, P. fusca predominated, and the low temperature of May 23 increased its proportions. After this date, temperatures remained high and this species remained in the minority. It may be noticed that the curve for P. rugosa and P. hirticula in this area are almost identical.

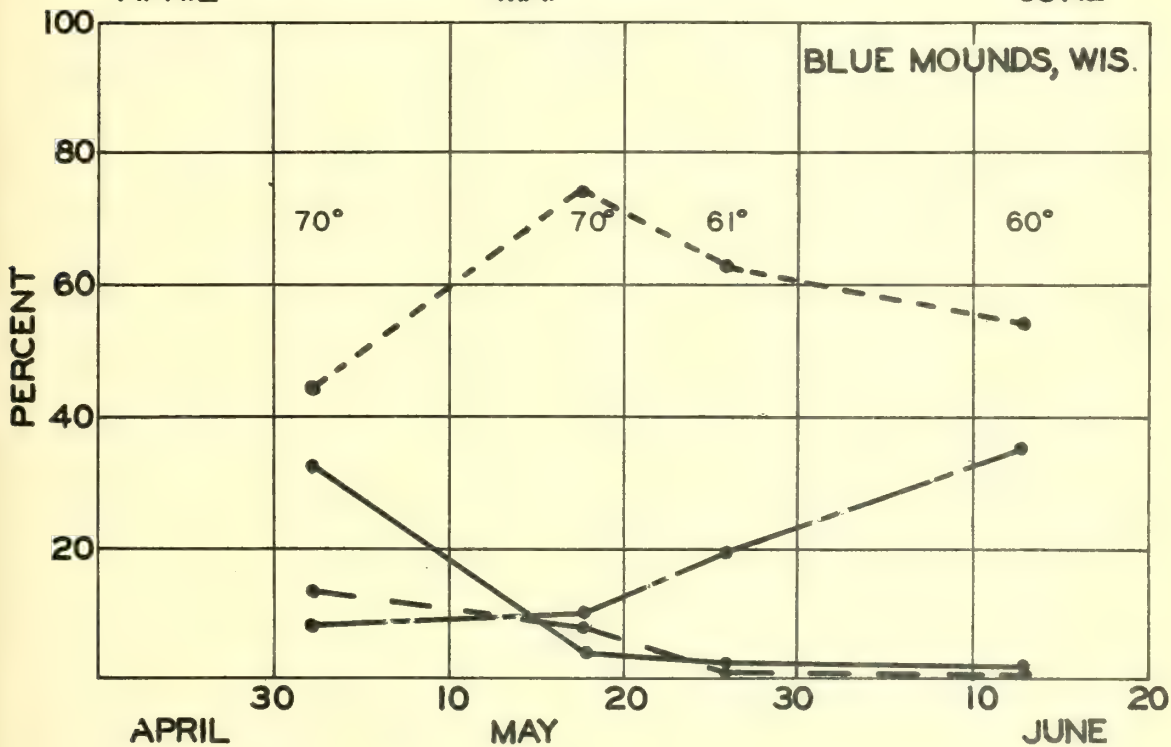
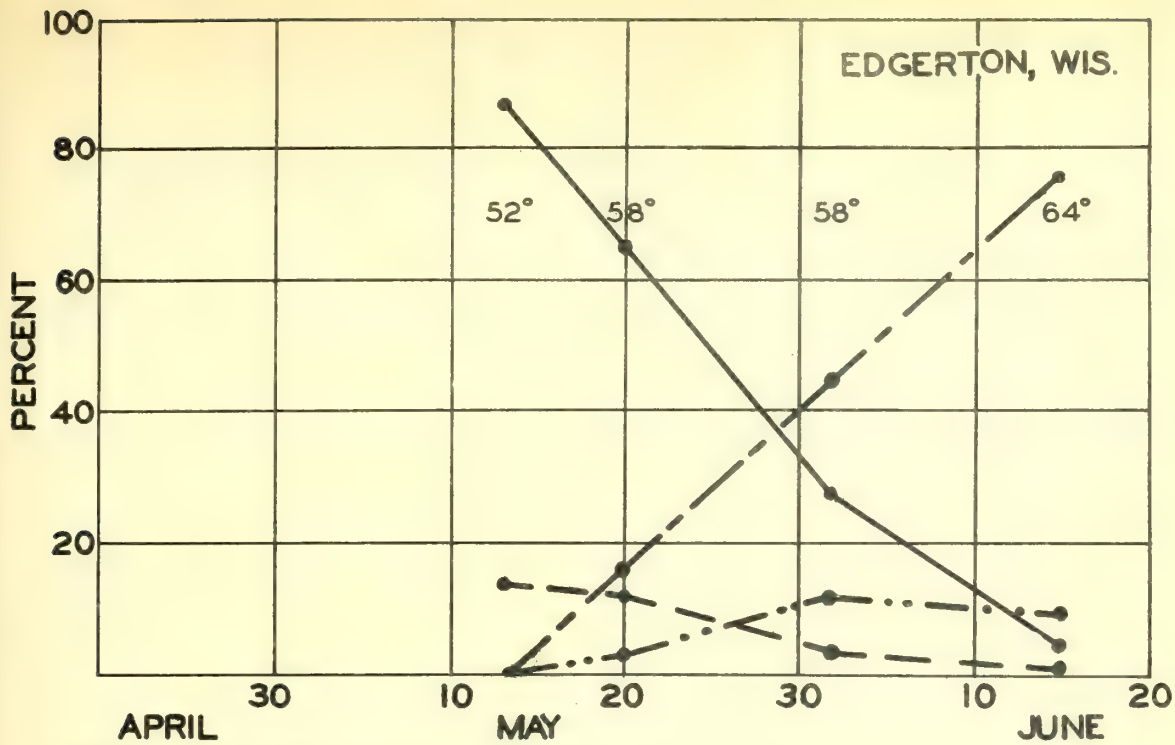
Figure 2 represents similar data from the Leeds grove. In this area P. fusca and P. rugosa predominate. The first three collections were made when temperatures were 56° F., or lower. In all three collections, P. fusca beetles were most abundant and in the first two no other species was taken. On June 13, with a temperature of 62°, P. rugosa predominated.

At Edgerton P. fusca and P. rugosa also predominated. P. hirticula was abundant there in 1935, the year of the previous "A Brood" flight, but scarce in 1938. Figure 3 shows that, of the four predominant species, P. fusca was the most abundant on May 13, when the temperature was 54° F. and on May 20, when the temperature was 58°, but had declined by June 2, when the temperature was also 58°. Apparently 58° is high enough to produce a slow emergence of P. rugosa when the season is sufficiently advanced.

Blue Mounds is near the north edge of the area in which P. hirticula is much more abundant than any other species. P. hirticula was predominant at Blue Mounds, but P. rugosa and P. fusca are also fairly abundant. Figure 3 shows P. hirticula to be most numerous in all the collections made in that area. P. fusca was more common than P. rugosa in the first collection, but diminished in numbers afterward as P. rugosa increased.







P. FUSCA  
P. RUGOSA  
P. HIRTICULA  
P. TRISTIS  
P. IMPLICITA

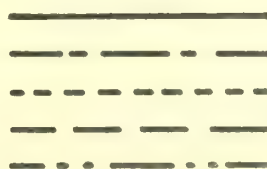
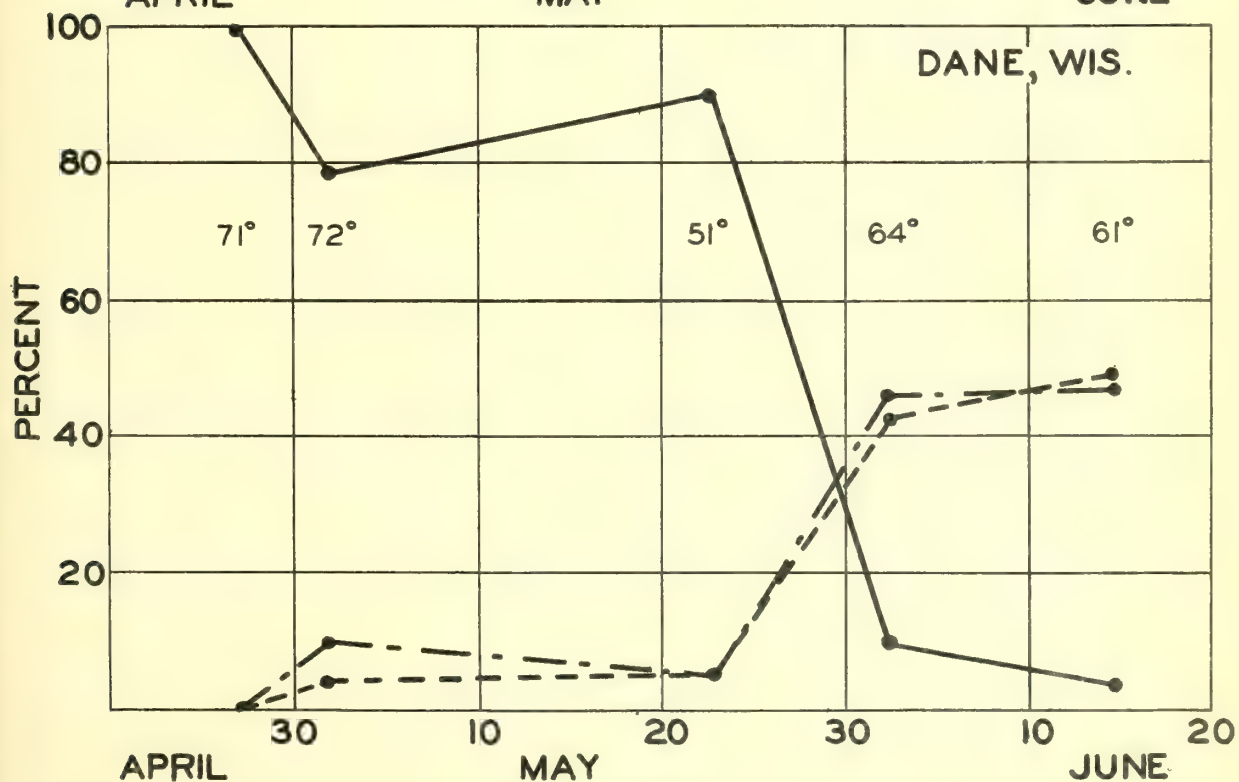
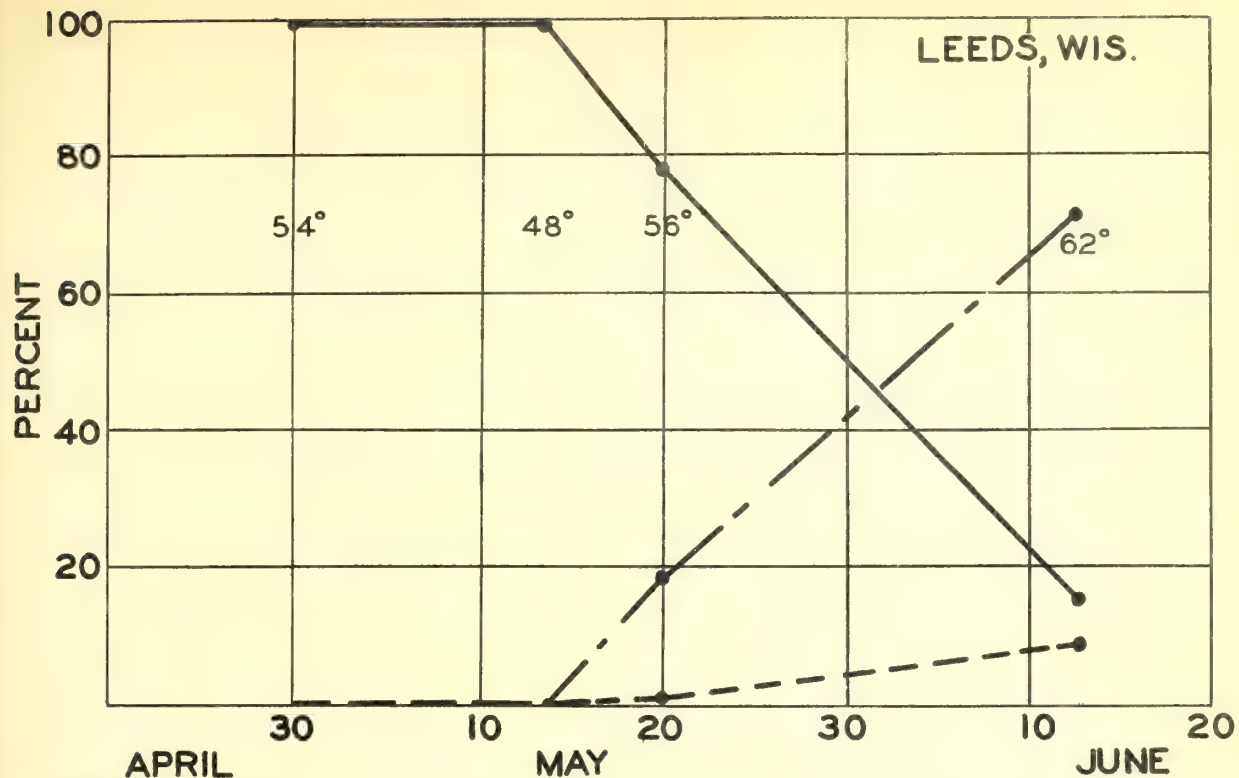


Figure 2.--Proportional populations of various species of Phyllophaga on different dates at different temperatures, 1938.





P. FUSCA  
P. RUGOSA  
P. HIRTICULA



Figure 3.--Proportional populations of various species of *Phyllophaga* on different dates and at different temperatures, 1938.





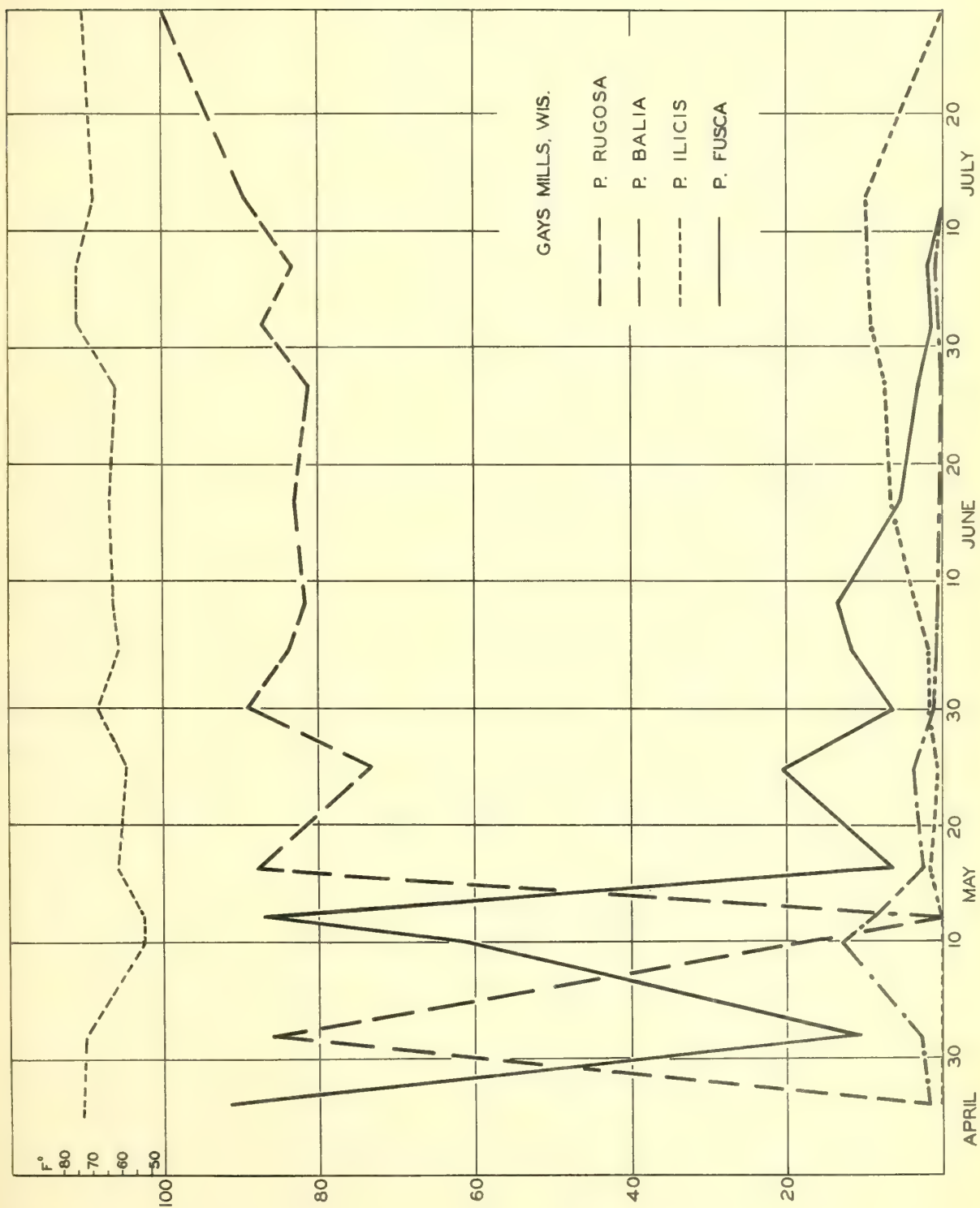


Figure 4.--Proportional populations of various species of *Eurythoe* on different dates and at different temperatures, 1938.





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BUREAU OF  
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## THE MORE IMPORTANT RECORDS FOR MAY

By the fourth week in May egg hatching of the migratory grasshopper and the two-striped grasshopper was almost completed in the upper Great Plains region. Complete destruction of some fields of crops had occurred in the western part of the Dakotas and Nebraska and in eastern Montana and Wyoming. In the Southern Plains region hatching of the migratory range grasshopper also was practically complete. East of the Great Plains migratory grasshoppers were advanced to second-stage nymphs during the third week in the month in Michigan, central Wisconsin, and in parts of Minnesota and Iowa, and control operations are well under way at several points. In southern Missouri hatching was well advanced during the second week of May. In the Pacific Northwest the migratory grasshopper and the red-legged grasshopper were damaging wheat and alfalfa in Idaho during the first week in the month.

The heaviest infestation by the Mormon cricket ever recorded in South Dakota was reported during the second week in the month in Walworth County. This insect was also reported as very abundant in southern Tooele County, Utah, and in several counties in Nevada.

Very heavy flights of June beetles are reported from the East Central States. Damage to pecans by these insects is reported from the lower Mississippi Valley.

Damage by wireworms occurred very widely throughout the country. Heavy damage to tomatoes and watermelons by the sugar beet wireworm was reported from the San Joaquin Valley in California.

Very heavy infestation by grubs of Japanese beetle was reported from southeastern New York and northeastern Maryland.

The first adults of white-fringed beetle were collected in northern Florida on May 22. Larvae have caused serious damage to crops in limited areas this season. The first adult was taken in the New Orleans area on May 11. The first pupa of Naupactus sp. was found at Saucier, Miss., on April 29 and at Gulfport, Miss., on May 1.

In general, cutworms were subnormal in abundance during the month; however, the pale western cutworm appeared in outbreak numbers in western Kansas, where over 10,000 acres of wheat had been destroyed by the first week in May.

In the East Central States there was a general infestation by hessian fly in northern Indiana and northwestern Ohio.



Spring migration of the chinch bug to small grain started during the first week in May in Indiana, Illinois, western Missouri, in the three southern tiers of counties in Iowa, and in southeastern Nebraska and north-central Kansas during the third week in May.

The greenbug is generally prevalent throughout the Wheat Belt of Kansas and Oklahoma but little injury has occurred to wheat in Kansas, although oats and barley have been damaged in places. In Oklahoma oats were a complete failure in Kay County.

A somewhat heavy flight of armyworm moths was reported from Indiana during the second week in May. Some damage by armyworm is also reported from southeastern Missouri and from the Delta counties of Mississippi.

The wheat brown mite seriously damaged many fields of wheat in western Kansas and southwestern Oklahoma.

Corn ear worm damage is being reported from the South Atlantic and lower Mississippi Valley States. Pupae in hibernation cages in Illinois failed to pass the winter, but in the St. Louis area of Missouri a 23-percent survival occurred. Rather severe damage to corn was reported from southern California.

Pea aphids began to appear in the Middle Atlantic States early in the month largely on clover and alfalfa. Severe damage to alfalfa was reported from the northern tier of counties in Indiana, in west-central and south-central Illinois, in southern Michigan and Wisconsin, and in eastern Kansas. Early in the month damage to vetch was recorded from the Willamette Valley of Oregon and some damage to cannery peas was reported from northwestern Oregon.

Tent caterpillars were doing considerable damage to fruit trees in Washington, Oregon, and California.

First adult codling moths of the season were taken on May 3 at Paducah, Ky., on May 6 in the Vincennes area of Indiana, on May 8 at Staunton, Va., and in southern Ohio, in northeastern Kansas and northwestern Missouri on May 10, and on May 19 in central Ohio.

Very heavy populations with considerable damage by the fruit tree leaf roller was reported from western Illinois and eastern Missouri.

Aphids attacking apple were abnormally abundant early in the month in New England and the heaviest infestation in the last 10 years occurred during the latter part of the month in the Hudson River Valley. Heavy infestations also reported in western New York. From 10 to 30 percent of the apple crop in the Cornelia section of Georgia has been damaged by the rosy apple aphid. Increasing damage by this insect is also reported from the Vincennes area of Indiana. Apple grain aphid is very prevalent in Michigan and Wisconsin. In the latter State it is one of the most severe outbreaks ever observed.

Infestation by the plum curculio in the Fort Valley section of Georgia is heavier than usual. A fairly heavy drop of peaches is also recorded from the Cornelia section of Georgia. Increased abundance of this insect was reported from Kentucky, Illinois, Missouri, and Kansas.

Large pecan trees were completely defoliated by a tortricid, Cacoecia infumatana Zell., in southwestern Louisiana. This appears to be a new pecan pest.

Potato flea beetles were seriously damaging potato foliage late in the month in New York, Virginia, and Indiana. Heavy infestations were also reported from the Pacific Northwest.

The bean leaf beetle was generally prevalent along the south Atlantic seaboard and in the East Central States.

The pea weevil reached its peak of migration into fields on May 8 in Oregon and between May 13 and 15 in Washington and Idaho.

The pepper weevil was discovered in two additional counties in Florida--Charlotte and Hillsboro.

Flights of moths of the beet webworm were observed in the latter half of the month in Utah, Idaho, and Montana.

Large populations of beet leafhopper were reported in the Promontory Point breeding area of Utah. This is the heaviest infestation in the last 4 years for that area.

Heavy populations of overwintered cotton boll weevil were reported from South Carolina, Georgia, and Florida, with somewhat heavier emergence than last year in Louisiana and Texas.

A very unusual outbreak of cankerworms covers a wide belt from Ohio across Illinois and Indiana to South Dakota, Nebraska, and Kansas. Elms and unsprayed apples in many places are completely defoliated.



# GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

General. W. E. Dove (May 26): In the Red River Valley areas of Minnesota and North Dakota, in eastern Montana and Wyoming, and in western North Dakota, South Dakota, and Nebraska, hatch of migratory grasshopper Melanoplus mexicanus Sauss. and two-striped grasshopper M. bivittatus Say is almost complete while hatching of the big yellow grasshopper M. differentialis Thos. is just beginning. Rapid hatch and acceleration of development of young hoppers caused by warm, dry weather. Rapid movement from adjacent idle and range lands into cropped areas temporarily reduced by rains occurred during the week. Although average percentage of damage to crops in the northern Great Plains area remains small, some fields have been completely destroyed in parts of Wyoming, eastern Montana, and the western part of North Dakota, South Dakota, and Nebraska. Heaviest damage where grasshoppers hatched in fields in which the grain had been stubbled in. Hatching of migratory ran grasshopper in the Texas Panhandle, Oklahoma, northeastern New Mexico, and eastern Colorado practically complete in some areas and less advanced in other areas of higher altitudes. A very small hatch occurred in the Mississippi Valley during the last week.

Michigan. R. Hutson (May 24): M. mexicanus seen throughout the Lower Peninsula. Second-stage nymphs observed in several places as far north as Roscommon. Cannula pellucida Scudd. observed hatching at Roscommon and in the southeastern counties. Ageneotettix deorum Scudd. is in the same stage of development in the same area as M. mexicanus.

Wisconsin. E. L. Chambers (May 22): M. mexicanus began hatching in the light-sand areas in the vicinity of Juneau County, central Wisconsin, on May 10, and control activities are being carried on in that county. Last spring hatching began about April 15.

Minnesota. A. G. Ruggles and assistants (May 20): Main hatch of M. mexicanus amounts to 8 percent in some spots and 100 percent in the Red River Valley. First hatch recorded on April 27. M. bivittatus second to M. mexicanus. Very few C. pellucida hatched to date. Hatching reported as started in Chisago, Otter Tail, Bennington, and St. Louis Counties.

Iowa. C. J. Drake (May 26): M. bivittatus and M. mexicanus hatching in large numbers, particularly along the Missouri Valley. Control operations in progress for 2 weeks, particularly near the larger cities. Semi-drought conditions favorable for young grasshoppers during the hatching period.

Missouri. L. Haseman (May 24): Hatch in the north-central part of Missouri delayed by the weather, and until the middle of May very little hatching had occurred in the northern tier of counties. Heavy hatch in places reported from southern Missouri 2 weeks earlier.

G. D. Jones (May 10): North-central Missouri is the area most heavily infested with eggs, according to the survey of last fall, which indicated that more than normal egg populations exist in every district where grasshoppers were abundant last year. Eggs held back in development owing to c



weather. Reports indicate hatching of small brownish grasshoppers as starting last week in southern Missouri. In central Missouri eggs of the yellow grasshoppers about ready to hatch.

Nebraska. M. H. Swenk (May 18): Hatching started in such abundance during the second week in May that distribution of bait was begun in eastern and western Nebraska. Species concerned include chiefly M. bivittatus and M. mexicanus, with a lesser number of M. differentialis.

Oklahoma. C. F. Stiles (May 23): Dissosteira longipennis Thos. hatching in large numbers in Texas and Cimarron Counties, in the Panhandle. Control operations under way for 2 weeks. M. mexicanus reported as hatching in large numbers in the northern part of the Panhandle. M. confusus Scudd. generally distributed over the pasture land of the western half of the State, many having reached the adult stage, and damaging some pastures. Hatching of M. differentialis and M. bivittatus delayed, and nymphs not appearing in damaging numbers yet.

Montana. H. B. Mills (May 20): Practically a 100-percent hatch of eggs of M. mexicanus occurred from May 3 to 5, south of the Missouri River, in an area involving Richland, McCone, Garfield, Petroleum, Rosebud, Treasure, Custer, Prairie, and Dawson Counties. At the same time approximately 20 percent of the eggs had hatched north of the river, the hatch being about a week later than in the southern area.

Idaho. W. E. Shull (May 5): Populations of M. mexicanus and M. femur-rubrum Deg. considerably above normal in Nez Perce, Clearwater, and Latah Counties. Slight damage to wheat and alfalfa.

Utah. G. F. Knowlton (April 29): Nymphs becoming increasingly abundant throughout northern Utah. Most nymphs of Melanoplus sp. still in first instar, but in warm spots, second- and third-instar nymphs are common to abundant. Moderate numbers of early maturing species are now adults on range lands and fewer on farms. (May 9): Serious outbreak, covering 200 acres, reported at Redmond. (May 13): Warrior grasshoppers (C. pellucida) hatching in large numbers in some meadows west of Ephraim. Control operations starting in Sevier, Davis, and Utah Counties. (May 18): Crops being damaged at Rochester, Emery County, and flower-garden plants at Brigham. Damage to fields of alfalfa occurring at Green River.

Nevada. G. G. Schweis (May 19): Grasshoppers, particularly M. mexicanus, have hatched over considerable parts of central and western Nevada, and at present control operations are under way in Humboldt, Pershing, Churchill, Lyon, Nye, and Washoe Counties.

Arizona. E. R. Tinkham (April 28): Heavy infestation of M. mexicanus covering approximately 45 square miles, lies at the eastern base of the Galupuro Mountains in the Sunset region, 15 miles west of Bonita, Graham County. This is the fourth year of infestation and the infested area is increasing. Three distinct color phases of Aulocara elliotti Thos. found at Sunset, of which the grey phase predominates, attacking chiefly grama grass. Principal stages present were in the third and fourth instars.

Washington. L. G. Smith (May 5): M. mexicanus in the third instar observed on May 3 near Tiger, Pend Oreille County. Population about 1 to 10 per square yard, and probably one of the first hatches of 1939. Reported from Adams and Lincoln Counties on April 27; from Garfield County on April 29; and from Whitman County on May 1. (May 12): M. mexicanus observed in the first to fourth instars around Richland, Benton County, in small numbers attacking pasture land. (May 23): M. femur-rubrum found hatching from 500 to 600 per square yard in a  $\frac{1}{2}$ -acre lot in West Ellensburg, Kittitas County. Average of 20 to 200 per square yard in other lots and in the first to third instars. M. mexicanus were hatching 50 to 60 per square yard in alfalfa near Goldend Klickitat County, on May 17, and from 40 to 50 per square yard in wheat bordering wheat and barley fields in the Goodnoe Hills. Some in the third star. Grasshoppers observed in the first, second, and third instars on May 13 in scab-land grass at the edge of alfalfa near Amber, Spokane County, and found 20 to 30 per square yard in the third and fourth instars on May 1 in the edge of a wheatfield near Gardena, Walla Walla County.

California. L. A. Burch (May 9): Unusually early hatch and intensity of infestation of the valley hopper Oedaleonotus enigma Scudd. necessitated intensive control measures in Kern County. Infestation heaviest ever seen by the writer. Considerable damage done to crops bordering grasslands, extending for a mile or two. Heavy infestations have occurred in the foothills east of Delano, McFarland, Famosa, Lerdo, around the Edison orange groves and potato fields, and through the Arvin and Commanche Point sections, where there were the greatest losses and heaviest infestation in the county. Grasslands infested from the edge of the cultivated fields clear back to the mountains.

#### MORMON CRICKET (Anabrus simplex Hald.)

South Dakota. H. C. Severin (May 12): Damage to wheat and range grasses reported from Walworth County. Population built up during the last 10 years until now there is the largest population in the State ever observed.

Utah. C. J. Sorenson (May 21): Very abundant in southern Tooele County; beyond expectations based on egg survey of last fall.

Nevada. G. G. Schweis (May 19): Hatch normal for this area, and control operations now being carried on in Elko, Humboldt, Eureka, Lander, and Pershing Counties.

#### COULEE CRICKET (Peranabrus scabricollis Thos.)

Washington. L. G. Smith (May 12): Reported as abundant and localized in the Nespelem area, Okanogan County; in the third, fourth and fifth instars. Control operations under way.

#### EUROPEAN EARWIG (Forficula auricularia L.)

Idaho. W. E. Shull (May 5): Populations greatly increasing and area of infestation spreading in Latah County. Gardens attacked but damage not extensive.

Utah. G. F. Knowlton (April 29): Hatching during the last few days at Farmington. All young found still in the nest. Adults abundant. (May 17): One-hundred female Bigonichaeta setipennis Fall. shipped from Puyallup, Wash., on May 15 and released for control at Farmington on May 16. Found present near resi-



dences in the Cottonwood area, and at Holladay, Salt Lake County.

Washington. E. W. Jones (May 17): New brood prevalent in gardens at Walla Walla.

Correction: The note on this insect in the Insect Pest Survey Bulletin, October 1, 1938, page 575, from Alabama, is erroneous.

SAY'S STINKBUG (Chlorochroa sayi Stal)

Montana. H. B. Mills (May 14): More abundant in the Havre area than at this time last year.

JUNE BEETLES (Phyllophaga spp.)

Massachusetts. A. I. Bourne (May 23): First June beetles found during the evening of May 9. Much more abundant since that time on warm nights than at any time last year.

Virginia. M. P. Jones (May 6): Specimen of P. inversa Horn collected on screen door at Arlington on the night of May 5. (Det. by E. A. Chapin.)

Mrs. J. C. Miller (May 2): Specimens of P. fervida F. brought in from Brandy, Culpeper County. Reported as defoliating oaks in the vicinity and catalpa trees on the premises where collected. (Det. by E. A. Chapin.)

Ohio. N. F. Howard (May 16): First adult, a small species, seen flying today at Columbus.

Illinois. W. P. Flint (May 26): A moderate flight of June beetles now taking place, with rather large numbers appearing in the northwestern part of the State. No defoliation noticed.

Kentucky. W. A. Price (May 23): Early in May hordes of beetles stripped many chinquapin, bur, red, and pin oaks throughout the central bluegrass region. Species responsible for most of the injury was P. hirticula Knoch.

Wisconsin. C. L. Fluke (May 19): Number-two white grubs slow in reaching surface, some at 19-inch depths as late as May 10. Number-three grubs came up earlier. Grubs apparently less numerous than 3 years ago.

Mississippi. C. Lyle (May 23): May beetles, P. calceata Lec., reported as injuring pecans in Yazoo County.

Louisiana. O. I. Snapp (May 11): May beetles had completely defoliated a number of young pecan trees by May 11 at Minden, northwestern Louisiana.

Iowa. C. J. Drake (May 26): June bugs are emerging in fair numbers throughout the State. A survey of the species of Brood B is being made.

Missouri. L. Haseman (May 24): Since about May 10 three or four different species of June beetles have been abundant, particularly one rather large species.



A. C. Burrill (May 17): Rosebuds attacked at Jefferson City. First injury of year.

Kansas. H. R. Bryson (April 27): Abundant in most gardens, strawberry patches and cultivated areas. Numerous enough at Junction City to cause some injury to wheat. May beetles have just begun coming to lights.

Utah. G. F. Knowlton and F. C. Harmston (May 18): Reported as causing considerable damage to fall wheat in Carbon County, especially in the area near P

#### WIREWORMS (Elateridae)

New York. N. Y. State Coll. Agr. News Letter (May 22): Apparently more numerous in Orleans County, western New York, than usual. Eastern field wireworms (Limonius ectypus Say) proving a considerable pest in several greenhouses Monroe County, western New York. Evidence indicates that they are breeding in these locations.

North Carolina. J. U. Gilmore and W. A. Shands (April): Quantitative sampling of Monocrepidius spp. done on November 3, 1938, in a field of soybean stub near Rocky Mount, an average of 1.2 wireworms per square foot being found examining a 6-inch depth of soil in 10 square-foot samples taken at random. Thirty-two similar samples on March 27, after field had remained undisturbed during fall and winter, showed an average of 1.9 wireworms per square foot. Fields thoroughly plowed to a depth of about 6 inches soon after March 27 on April 12, from 32 similar samples, there was found an average of 1.1 wireworms per square foot. Soil loose and rather dry on last sampling date and it seems probable that some wireworms were below the 6-inch depth of sampling. Sampling on first date confined to an area of 0.4 acre, while for the second and third dates original area extended to include 1½ acres.

Georgia. T. L. Bissell (May 19): Corn at Experiment, in a date-of-planting following Austrian peas, now attacked by wireworms, possibly Monocrepidius sp., of which 29 were found in 208 stalks.

Missouri. L. Haseman (May 24): A few scattered reports of serious damage to corn received from the north-central part of the State.

Nebraska. D. B. Whelan (April 27): Wireworms (Ludius sp., possibly L. noriper Kby.) found feeding in a grasshopper egg mass from York on April 21. Others of the same species found in similar locations on the same date, three bolts the most in any one capsule. Other wireworms, Limonius sp., taken from a wheatfield near Kimball. (Det. by A. G. Boving.)

Kansas. H. R. Bryson (April 27): Small wireworms, Aeolus dorsalis Say, numerous in a wheatfield at Junction City on April 24, but not causing injury.

Washington. H. P. Lanchester (May 17): Limonius californicus Mann. noted damaging sugarbeets near Lowden.

California. M. W. Stone (May 20): Tomato plantings in Orange County thinned considerably during May from attack by L. californicus. In a 10-acre field

near Santa Ana over 54 percent of the plants were killed, and in a 6-acre planting near Stanton over 38 percent of the stand was replanted. Lima beans planted early in May also damaged extensively. In parts of a 60-acre planting near Santa Ana every seed examined was infested with from 1 to 9 larvae, and an average of 5 larvae obtained per foot of row. Damage in the 60-acre planting of melons near Downey, Los Angeles County, continues. Between April 14 and May 18 the number of plants in 86 hills was reduced from 344 to 109.

R. E. Campbell (May 1): Many watermelon fields in southern Fresno County, central California, being damaged by L. canus Lec. In a typical 20-acre field the infestation was scattered, except in one corner where over 2 acres were almost completely denuded of plants. Counts on 5 plants showed from 16 to 48 wireworms attacking a single plant, averaging 26 per plant. Field had been replanted 4 times, 4 acres being abandoned and planted to kafircorn.

#### JAPANESE BEETLE (Popillia japonica Newm.)

New York. N. Y. State Coll. Agr. News Letter (May 15): Situation serious in Westchester County. To determine a cross section of the county a square foot of turf was taken up from 90 areas in April and grubs counted. Number per square foot was from 29 to 83, averaging 61.

D. M. Daniel (May 29): In 78 diggings in Westchester County from April 11 to 22, 1,289 grubs were found; average per square foot for county was 16.5. Diggings in central New York from May 8 to 24 revealed larvae at Elmira, Waverly, Oswego, Binghamton, and Brighton; none at Mount Morris.

New Jersey. E. Kostal (May 2): Grubs abundant in the upper 4 inches of soil at Morganville, Monmouth County, especially in sod. Lawns are showing some damage from feeding last fall.

Maryland. E. N. Cory (May 9): Spinach was being destroyed by grubs as fast as it sprouted at Bradshaw, Baltimore County; two plantings already destroyed. Grubs present in the parts of the field dug at the rate of 8, 7, and 5 per square foot. Apparently the first record in Maryland of injury to roots of a vegetable crop.

#### A WEEVIL (Calomyeterus setarius Roelofs)

New York. Eileen B. Rabbitt (May 2): Flowers raised in southern Dutchess County on land uncultivated until 2 years ago were practically destroyed. Most of the flowers eaten down to the roots, with the exception of petunias and marigolds. (Det. by L. L. Buchanan.)

#### ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. E. P. Felt (May 23): Grubs somewhat abundant in lawns at Stamford.

New York. D. M. Daniel (May 29): Larvae found, while digging for the Japanese beetle, mostly in the southern end of Westchester County.



WHITE-FRINGED BEETLE (Naupactus leucoloma Boh.)

Florida. H. C. Young and assistants (May 22): First adult taken near Svea, Okaloosa County, on May 22. First adult taken on May 25 in 1938. Very few pupae found but many larvae are full grown and have begun to prepare cells. Larvae have caused serious damage to crops in limited areas this season.

Louisiana. B. A. App and S. J. Snow (May 22): First adult taken at New Orleans on May 11. In 1938 first adult taken on May 14. On May 11 in the warmer soils 13.5 percent of the larvae had pupated but no pupae were found in the heavy clay soils.

A WEEVIL (Naupactus sp.)

Mississippi. J. B. Gill (May): First pupa of Naupactus sp. taken at Saucier April 29 and at Gulfport on May 1. In 1938 the first pupa was taken on May 6. First adult taken on May 17, 1939, as compared to May 26 in 1938. On an occasional pupa could be found on May 15. Larvae have damaged a wide range of field and truck crops during this spring in the Gulfport area.

FALSE WIREWORMS (Eleodes spp.)

Kansas. H. R. Bryson (May 17): Abundant in western Kansas. Many larvae reported as having pupated around May 1; beetles out in Rice County.

CUTWORMS (Noctuidae)

Virginia. A. M. Woodside (May 22): Cutworms have been damaging onions in Augusta County, entering the hollow leaves and feeding inside.

Ohio. T. H. Parks (May 18): Specimens of bronze cutworm Nephelodes emmedonia Cran. received with the report that they were killing bluegrass pasture near New Philadelphia. A trip to Licking County, where it was so abundant last year, produced only 10 larvae in 30 minutes' search. A disease wiped them out of this area last year. (May 22): Some injury to grape buds from climbing cutworms occurred early in May in Franklin and Erie Counties. No injury to fruit trees reported.

Michigan. R. Hutson (May 24): Collections at St. Joseph, Coloma, Niles, Eau Claire, Fennville, Grand Rapids, Muskegon, Shelby, Howell, Mount Clemens, Detroit indicate these pests as not yet particularly numerous.

Iowa. C. J. Drake (May 26): Not reported as very abundant this year.

Missouri. L. Haseman (April 27): Until April 26 very few authentic reports received from any part of the State, and at Columbia examinations indicate a scarcity of cutworms this spring.

Nebraska. M. H. Swenk (May 18): Reported as attacking sweetpotato plants in Thayer County on May 1, and wheatfields and barley fields in Dundey County on May 10.



D. B. Whelan (May 18): Dusky cutworm (Feltia venerabilis Walk.) was cutting off young string-bean plants at Lincoln on May 14.

Kansas. H. R. Bryson (May 27): Pale western cutworm (Agrotis orthogonia Morr.) reported in an outbreak in western Kansas on May 5. It has killed approximately 10,000 acres of wheat. On May 23 scarce, except for the outbreak mentioned above. Injury to garden crops reported in some localities. One species observed to be abundant in gardens in Jewell County on May 20.

H. H. Walkden (May 6): Extensive damage to wheat and barley by pale western cutworm in Rawlins and Thomas Counties; moderate damage in Logan, Gove; and Sheridan Counties; and some damage in Scott, Lane, and Ness Counties. Damage also reported from Meade County. No damage in Rush County where a severe outbreak occurred in 1937-38.

Texas. R. K. Fletcher (May 22): Damage light, judging by the few requests for control information.

Utah. G. F. Knowlton (May 24): Reported as abundant in some alfalfa fields at Lewiston and Cornish on May 5; as cutting off leaves of ferns in a flower garden at Logan on May 22; and as cutting off nearly half of some tomato plants the first night they were set out in a garden at Logan.

G. F. Knowlton and F. C. Harnston (May 18): Causing severe injury to corn in the Green River area of Emery County.

Nevada. G. G. Schweis (May 19): Reported in epidemic numbers in Nye and Pershing Counties.

Washington. C. E. Woodworth (May 8): Several species of cutworm moths very troublesome entering houses at Walla Walla.

L. G. Smith (May 23): Moths appeared about May 5 in great numbers in Pasco and vicinity and are appearing in all buildings, probably throughout Franklin County. Appearance expected because of great numbers of cutworms on the range.

#### AN ARCTIID (Callarectia phyllira Drury)

Alabama. J. M. Robinson (May 20): Specimens just received of larvae which were devouring cotton and corn plants in the field at Miller's Ferry, Wilcox County. (Det. by H. W. Capps.)

#### SPITTLEBUGS (Cercopidae)

New York. N. Y. State Coll. Agr. News Letter (May 22): First observed on May 16 in western Suffolk County on pine and chrysanthemums. Observed in strawberry beds in some sections of the State during the last few weeks. Now nymphs and characteristic masses of spittle are evident.

Pennsylvania. H. E. Hodgkiss (May 18): Observed on clover in Lancaster County on April 19. Large numbers of nymphs in first and second instars.

E. J. Udine (May 30): Several inquiries received, 5 to 6 nymphs per stem of alfalfa reported as common near Newville. Also found on wheat, and various weeds in more than usual numbers near Carlisle.

Maryland. E. N. Cory (May 19): Reported on alfalfa, clover, and weeds at Gambrells, Easton, and Hagerstown.

Gertrude Myers (May 27): Abundant near Rockville.

Missouri. A. C. Burrill (May 17): Noted on grasses at Jefferson City, at a rate of from 3 to 6 spittle masses per square yard of herbage. (May 25): Infestation has increased to 6 to 22 spittle masses per square foot. Much bedstraw in Jefferson since the drought of 1936, and single strands run 4 to 6 masses per strand.

Washington. L. G. Smith (May 12): Infested strawberry plant brought in by a farmer from Snohomish County on May 9.

#### COMMON RED SPIDER (Tetranychus telarius L.)

Maryland. E. N. Cory (May 22): Reported on evergreens and strawberries at Pileville and Emmitsburg.

Virginia. H. G. Walker and L. D. Anderson (May 27): Rather serious damage caused in some strawberry fields in the Norfolk area. Somewhat abundant on ornamental plants in some areas.

South Carolina. W. C. Nettles (May 22): Reported on firethorn in Sumter County.

Georgia. T. L. Bissell (May 10): Abundant on wild geranium and some on vetch at Clarkston, central Georgia; getting into nearby raspberries.

Florida. J. R. Watson (May 23): Abundant on many plants including cotton.

Mississippi. C. Lyle (May 23): Infested arborvitae, bean, and fern plants received from Calhoun, Harrison, Monroe, and Montgomery Counties.

Texas. R. L. McGarr (May 6): Observed doing damage in four fields of cotton at Port Lavaca, and in one field of cotton at Robstown, both in Calhoun County.

Oregon. H. E. Morrison (May 8): Seasonal development 7 weeks in advance of the 1938 season in the Willamette Valley. Light infestation on hops.

### CEREAL AND FORAGE CROP INSECTS

#### WHEAT AND OTHER SMALL GRAINS

##### HESSIAN FLY (Phytophaga destructor Say)

General. C. Benton (April 20): Pupation started near La Fayette, Ind., about April 1. Dissections made on April 19 showed 32 live pupae present in 100 puparia. No emergence of the flies has been observed. A spring survey of



fall-sown wheat was made from March 7 to April 5, covering 483 fields in 80 counties of Indiana; 34 fields in 4 southeastern Illinois counties; 22 fields in 4 northwestern Ohio counties; and 14 fields in 2 south-central counties of Michigan. In the area covered the 2 sections showing the most general infestation by the fall brood were northwest-central and northeastern Indiana and adjacent counties in northwestern Ohio. In these areas many fields were heavily infested, with thinned stands of wheat in poor condition of growth.

Ohio. T. H. Parks (May 22): No serious damage to wheat is anticipated in any part of the State.

Indiana. C. Benton (May 22): Pupae were found throughout April. First fly emergence and egg laying occurred on April 26. The crest of fly emergence and egg laying, first week of May, gradually decreased until May 22. First small larvae found on May 3. Mostly half-grown larvae, with a few full-grown, were found by May 20 in wheat. About 10 percent of overwintered puparia still contained viable larvae not pupated on May 20.

Kansas. E. T. Jones (May 26): Of 17 wheatfields examined on May 24 in Geary, Dickinson, and Marion Counties infested plants were found in 15. Based on samples of 50 stems each, average infestation per field was 9.7 percent, ranging from 2 to 30 percent, with an average of 3.7 puparia per infested stem. No injury apparent.

#### CHINCH BUG (Blissus leucopterus Say)

South Carolina. W. C. Nettles (May 22): Present but less abundant than formerly in Chester County. Of 10 small-grain fields surveyed, only 2 had corn planted adjacent, which apparently will help protect the corn.

Indiana. C. Benton (May 23): Spring migration to small grains started about May 1 and was practically completed by the middle of May. First mating observed in the field on May 9. By May 20 more than 50 percent found mating. Present numbers found in small-grain fields near La Fayette show a few spots in thin winter wheat and rye, with enough old bugs to produce a light-to-moderate infestation with continuation of present favorable dry-field conditions. No eggs or nymphs were observed.

Illinois. W. P. Flint (May 26): Scattered reports of infestation are coming in. Infested fields widely separated in most areas, the worst infestations occurring in heavily pastured rye.

Iowa. C. J. Drake (May 26): Very abundant in the three southern tiers of counties of the State, and here and there, infestation extends into the fourth tier. Weather conditions favorable this spring for the bugs to move from winter quarters to the small-grain fields.

Missouri. L. Haseman (May 24): Scattered reports, particularly from west-central, southwestern, and northwestern Missouri, indicate some rather heavy infestations, but the infestation is not general throughout the State.

G. D. Jones (May 10): Reported in considerable numbers in the southern, western, and northern parts of the State. Most general and heavy infestation



found in the northwestern area. Cool spring has kept them in hibernation longer than usual, and movement to grainfields evidently took place only recently. Fall survey indicated localized infestation similar to last year.

Nebraska. M. H. Swenk (May 18): Chinch bugs were flying early in May, especially during the period from May 6 to 14, in southeastern Nebraska northwest to Lancaster and Saline Counties. Injury to barley, rye, and wheat reported since May 8 in this area.

Kansas. H. R. Bryson (May 27): Reported as abundant on May 10, in some wheat fields in Nemaha County. From 8 to 12 bugs per square foot were counted in 1 field. Numerous in Smith, Cloud, Republic, Saline, and Dickinson Counties north-central Kansas.

#### GREEN BUG (Toxoptera graminum Rond.)

Missouri. L. Haseman (April 27): No complaints received.

Kansas. E. T. Jones (May 26): Numerous infestations of aphids were noted on May 24, on wheat and oats in Geary, Dickinson, and Marion Counties. Some injury observed. Predators also numerous.

H. R. Bryson (May 23): Present all over the Wheat Belt in Kansas. In many localities no injury to the wheat, but injury to barley is common. Serious damage to oats and winter barley in southern Kansas and to spring barley in northwestern Kansas.

Oklahoma. F. A. Fenton (May 22): The outstanding insect infestation during the last month seems to be the green bug. Infestation apparently most severe in Kay County, centering around Ponca City, but extends from this county in all directions. Wheat crop now beyond the point of serious injury and, as a whole, injured very little. Oat crop in that section almost a total loss, and a great deal of corn destroyed.

Texas. R. K. Fletcher (May 8): Taken from wheat in Dallas County. (Det. by F. W. Mason.)

#### PLANT BUGS (Miridae)

Montana. H. B. Mills (May 20): Labops hirtus Knight found injuring wheat adjacent range land in the Reese Creek area, northern part of Gallatin County.

Washington. R. D. Shenefelt (May 16): At Pullman Thyrillus pacificus Uhl. was attacking a strip of wheat about 20 feet wide by 300 feet in length. Apparently increasing.

#### ARMYWORM (Cirphis unipuncta Haw.)

Virginia. H. G. Walker and L. D. Anderson (May 27): Very scarce this spring in Norfolk, only one grower having reported injury, and the infestation was very light.

Indiana. L. F. Steiner (May 11): A rather heavy flight of adult armyworms to codling moth baits during the last 10 days in the Vincennes area.

D. W. La Hue (May 23): Large numbers of moths taken in a light trap at La Fayette on May 9.

Missouri. G. D. Jones (May 10): Reported to be in localized spots in southwestern Missouri on May 5. Not apparent in serious numbers but conditions favorable. No moths observed at Columbia.

L. Haseman (May 24): Reported from the southeastern part of the State that the first young were observed on May 13 in wheat and wild grasses and that a few moths were taken in codling moth traps a few days earlier. No infestation of any consequence.

Mississippi. C. Lyle (May 23): A light outbreak occurred during the last month on oats in Washington, Sunflower, Leflore, and a few other Delta counties. First specimens reported from Sunflower County on about April 24. Control measures used.

#### FALL ARMYWORM (Laphygma frugiperda A. & S.)

Mississippi. C. Lyle (May 23): Larvae received from Wayne County, where they were feeding on corn. Infestations light.

#### WHEAT WHITE GRUB (Phyllophaga lanceolata Say)

Kansas. H. R. Bryson (May 24): Abundant in wheat in south-central Kansas.

Oklahoma. C. F. Stiles (May 23): A beetle, probably P. lanceolata, reported as damaging cotton in Cotton County. Beetles were emerging from a nearby wheat-field.

#### MITES (Acarina)

Kansas. H. H. Walkden (May 6): Wheat brown mite has seriously damaged many fields of winter wheat in Rawlins and Thomas Counties, western Kansas. A few fields are practically a total loss. No barley fields observed as damaged but mites numerous on some plants.

H. R. Bryson (May 25): Brown spots occurring in wheat south of U. S. Highway 24, western Kansas, were caused by the presence of brown mites.

Oklahoma. F. A. Fenton (May 22): The brown mite (Tetranychina tritici Ewing) was a serious pest in wheat in the southwestern part of the State.

Texas. R. K. Fletcher (May 8): Mites, possibly Tetranychia longipes Banks, taken from wheat in Dallas County. (Det. by E. A. McGregor.)



CORN

CORN EAR WORM (Heliothis armigera Hbn.)

Georgia. T. L. Bissell (May 10): A few eggs on tomato leaves at Clarkston, central part of the State. Evidence of larvae feeding on leaves, but none found. (May 19): Injuring corn leaves at Experiment, starting on the open leaves and going into the bud. The largest are about 3/8 inch long. Attacking corn planted on April 5, rather than younger corn. Corn following Austrian peach at Experiment now attacked by corn ear worm. More abundant in the whole field than other insects. Corn now showing bud injury.

P. M. Gilmer and P. A. Glick (May 6): A few specimens noted in Tift, Berrien, Lowndes, Echols, and Cook Counties, southern Georgia. In one or two vetch fields, some injury to peach with vetch cover observed. None on cotton.

Florida. H. T. Fernald (May 22): Corn in the markets at Winter Park shows considerable injury.

Mississippi. C. Lyle (May 23): Larvae received from Pearl River County, where small Satsuma oranges were injured, and from Forrest County, where they were feeding on corn plants.

Louisiana. C. O. Eddy (May 25): Exceedingly abundant on the silk of early sweet corn.

Illinois. R. A. Blanchard (May 11): Hibernation cages located both in sandy and prairie-type soils in east-central Illinois failed to show any pupal survival following the winter of 1938-39.

Missouri. J. M. Magner (May 11): Pupae survived the winter of 1938-39 in hibernation cages in unprotected soil in the vicinity of St. Louis. A cage in light sandy soil showed 23-percent survival, whereas a cage in clay loam soil had only 3-percent survival.

California. R. E. Campbell and J. Wilcox (May 19): A 10-acre field, with ears about two-thirds grown, was badly infested in Orange County, southern California; over 50 percent of the ears already infested, and many eggs on the silks. In another nearby 10-acre field of younger corn, from 20 to 30 percent of the tassels were infested. In a third still younger field, an occasional larva was feeding on the foliage.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Massachusetts. A. I. Bourne (May 23): In the Connecticut Valley section of Hampshire County, approximately 20 to 25 percent of the overwintered larvae have pupated. Where areas were flooded by the hurricane last September larvae have survived the winter without difficulty, and approximately the same proportion of pupation has taken place as in cornstalks grown above flood level.



New York. L. A. Carruth (May 15): Pupation well under way on Long Island. On May 10 pupation ranged from about 20 to 32 percent in Nassau County. Last year approximately 75 percent of the borers had pupated by that date. (May 24): Moth emergence has begun on western Long Island, although it may be some time before peak emergence occurs. Spring development slower than usual. Up to May 23, approximately two-thirds of the overwintered larvae (two-generation strain) had pupated.

G. E. R. Hervey (May 15): In the Hudson Valley the first pupae were found on May 9 and on May 12 there was an average of about 9-percent pupation. No pupation in Albany County by May 10. Populations in Columbia County ranged from about 50 to 1,800 per acre.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

South Carolina. J. G. Watts (May 10): One specimen taken from corn seedling at Blackville.

Georgia. T. L. Bissell (May 19): Corn following Austrian peas at Experiment now attacked; 4 found in 205 stalks that showed bud injury.

WEBWORM (Crambus sp.)

South Carolina. W. C. Nettles (May 22): Damaging young corn severely in Oconee County.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Virginia. S. B. Fenne (May 11): Reported in several counties of Virginia. No severe damage apparent. Slight damage in Nottaway County.

Indiana. J. J. Davis (May 24): Reported as destroying young corn at Noblesville on May 20.

SOUTHERN CORN ROOTWORM (Diabrotica duodecimpunctata F.)

Georgia. T. L. Bissell (May 11): Larvae are killing considerable corn at Experiment in a field after Austrian peas. First-generation adults now numerous on flowers.

Mississippi. C. Lyle (May 23): Larvae received from Forrest County. Reported as causing injury to corn.

Texas. R. K. Fletcher (May 22): Damage light, judging by few requests for control information.

CORN BILLBUGS (Calendra spp.)

Oklahoma. F. A. Fenton (May 22): Maize billbug (C. maidis Chittn.) reported on corn in Chandler, Lincoln County.

Arizona. E. R. Tinkham (May 23): Volunteer corn heavily attacked 5 miles southwest of Tucson; 18 adults taken from 2 small plants.

SOUTHERN CORN LEAR BEETLE (Myochrous denticollis Say)

Alabama. J. M. Robinson (May 26): Reported from Linden on May 4 as feeding on young corn; appearing in such large numbers that they were destroying the leaves and the entire stalk. Reported again from Linden on May 15.

Kansas. H. R. Bryson (May 10): Several hundred acres of corn damaged in southeastern Kansas. Injury to corn reported as far north as Garnett.

SEED CORN BEETLE (Agonoderus lecontei Chaud.)

Kansas. H. R. Bryson (May 24): More abundant than they were last year.

ALFALFA AND CLOVER

PEA APHID (Macrosiphum pisi Kltb.)

Pennsylvania. H. E. Hodgkiss (May 18): A few found on clover and alfalfa in Lancaster County on April 19; in second and third instars.

Maryland. E. N. Cory (April 26): Reported as present in large numbers in alfalfa fields at Ridgely.

Indiana. J. J. Davis (May 24): Very destructive to alfalfa in LaGrange County in the extreme northern tier of counties, some fields being destroyed by May 10.

Illinois. W. P. Flint (May 26): Very abundant in west-central and south-central Illinois, killing alfalfa and red clover. Relatively scarce in the northeastern and the east-central parts of the State. Predators and parasites, particularly ladybeetles and aphid lions, very abundant.

Michigan. R. Hutson (May 24): A heavy infestation on alfalfa near Howell. Fungous disease, various hymenopterous and syrphid parasites, and ladybeetles and their larvae very numerous.

Wisconsin. J. E. Dudley, Jr. (May 15): First newly hatched nymphs found in alfalfa in the Madison area on April 24. Stem mothers were reproducing by May 1. By May 15 the infestation was heavier, and there was a larger proportion of alates, than usual. Early peas infested lightly on May 12.

Kansas. W. T. Emery (May 4): A light infestation in alfalfa fields at Manhattan and Topeka.

H. R. Bryson (May 23): Numerous in alfalfa fields all spring. Where no damage has resulted the crop has advanced far enough to escape injury. Still present in the field. Injury occurred to fields between Marion and Junction City. Ladybeetles numerous.

Utah. G. F. Knowlton (May 6): Increasing in abundance in the northern part of the State, but serious damage to alfalfa reported only from southern Utah. A few winged aphids collected during the last several days in northern counties.



Oregon. D. C. Mote (May 19): Aphids have continued to increase in peafields in the Willamette Valley since early April, and field peas are injured in places. In most vetch fields examined the predators have held the aphids in check. More aphids were reported as infesting the cannerly peafields of Umatilla County, than any year since 1934.

M. M. Reeher (May 22): Alates began moving into late fall-sown fields on April 17. On April 20 a few early fall-sown fields of common vetch and Austrian winter field peas were beginning to show some damage to individual tips. By May 15 several early fall-seeded Austrian winter field peas began to show damage in places. Some late fall-sown peas, close to early fall-sown fields also show some injured spots. Common vetch showed some tips killed late in April and early in May. By May 9 most of these fields had been nearly freed of aphids by coccinellid larvae and beetles. Injury not serious on either vetches or field peas but probably increasing in Austrian peas, owing to few natural enemies. Fungous disease has remained at a very low point, owing to dry weather. Aphids did not increase as rapidly on Austrian peas as expected and it is believed that some of this retardation of reproduction may be attributed to the slow growth of the plants during dry weather.

ALFALFA WEEVIL (Hypera postica Gyll.)

Idaho. F. H. Shirck (May 16): Reported as unusually abundant in many alfalfa fields at Parma.

Utah. G. F. Knowlton (May 13): Moderately abundant since May 5. Found in northern part of the State and in eastern Millard County.

California. A. E. Michelbacher (May 20): Rather scarce throughout the entire lowland area of middle California. Most abundant in the San Joaquin Valley, and in several fields as many as 100 adults were collected to 100 sweeps of the net on May 18. The percentage of larvae parasitized by Bathyploctes curculionis Thoms. based on rearing records of last-stage larvae collected on May 2, is as follows: San Joaquin Valley, 92.1; area about Pleasanton, 93.3; and in the San Francisco Bay area, 89.2.

CLOVER LEAF WEEVIL (Hypera punctata F.)

Ohio. J. S. Houser (May 6): A heavy infestation is causing damage to red clover on the Experiment Station Farm at Wooster. Far more abundant than in the average year.

Michigan. R. Hutson (May 24): Fairly abundant on alfalfa at Shelby.

ALFALFA SNOUT BEETLE (Brachyrhinus ligustici L.)

New York. N. Y. State Coll. Agr. News Letter (May 1): First feeding occurred on April 25 in Oswego County. Spreading of bait began on April 27. About 3,000 acres of infested alfalfa and clover in Oswego and Jefferson Counties to be baited this spring.



CLOVER ROOT BORER (Hylastinus obscurus Marsham)

New York. N. Y. State Coll. Agr. News Letter (May 15): On May 12 the first beetles appeared on screens of cages at Oswego. Destructive in Oswego, Onondaga, Cayuga, and Steuben Counties in the summer of 1938. Most of the injury was on medium red clover, with some on mammoth but none on alsike.

California. E. O. Essig. (May 8): First report of clover root borer on vetch. California made from Eureka, Humboldt County. Occurrence rare in this State.

THRIPS (Thysanoptera)

Nebraska. D. B. Whelan (May 18): Noted as very serious in a 5-acre field of alfalfa near Ashland, Saunders County, and in experimental plantings near Lincoln, Lancaster County, on May 17.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahr.)

North Carolina. J. S. Pinckney (April 24): First weevils emerging from hibernation quarters swept in the field today at Statesville.

Washington. W. W. Baker and B. J. Landis (May 20): Adults were swept from vetch in an orchard south of Husum, Klickitat County, on May 5.

GRASS

MEADOW PLANT BUG (Miris dolabratus L.)

Kentucky. W. A. Price (May 23): Very numerous on orchard grass at Lexington during May.

SUGARCANE

SUGARCANE BEETLE (Eustheola rugiceps Lec.)

Mississippi. C. Lyle (May 23): Specimens received from Marion County, where they were injuring corn.

Louisiana. J. W. Ingram (May 17): Injury lighter than usual, although there were some localities that suffered heavy losses of stand. Practically all beetles had stopped feeding by the middle of May.

YELLOW SUGARCANE APHID (Sipha flava Forbes)

Louisiana. J. W. Ingram (May 17): More abundant on sugarcane than they have been in recent years, apparently owing to the abnormally prolonged drought this spring. Injury to lower leaves observed in all fields.

CORN LANTERN FLY (Peregrinus maidis Ashm.)

Texas. R. K. Fletcher (May 22): Found heavily infesting sorghum in a greenhouse at College Station.

SUGARCANE BORER (Sesamia cretica Led.)

Egypt. A. H. Rosenfeld (April 28): Conspicuous during the last season by the very light infestations all over the Sugar Belt.

A COCCID (Pseudococcus boninsis Kuw.)

Egypt. A. H. Rosenfeld (April 28): The other most common cane insect, a mealybug, has been conspicuous during the last season by the very light infestations all over the Sugar Belt.

F R U I T I N S E C T S

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Mississippi. C. Lyle (May 23): Reported as causing injury to pecan trees in Simpson County the last week in April.

Nebraska. M. H. Swenk (May 18): Infestation of an elm tree reported in Burt County on May 15.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

New York. N. Y. State Coll. Agr. News Letter (May 22): A 10-acre block of 5-year-old trees seriously damaged in Wayne County, western New York. Buds damaged on all 1- and 2-year-old wood.

Mississippi. C. Lyle (May 23): Adults from peach received from Jones County.

Washington. E. P. Breakey (May 23): Unusually abundant in Pierce County, judging from the number of reports.

RED-LEGGED FLEA BEETLE (Derocrepis erythropus Melsh.)

Pennsylvania. A. B. Champlain (May 1): Reported as heavily attacking and injuring foliage of young apple, peach, plum, and cherry trees at Dillsburg, York County, on April 25.

H. E. Hodgkiss (May 18): Causing serious damage in widely separated counties to opening buds of grape, newly set apples, and peaches. Specimens collected in Perry, Cumberland, and Indiana Counties from May 8-10.

Maryland. E. N. Cory (April 26): Reported on buds of peach at Cumberland.

A BEETLE (Euphoria sepulchralis F.)

Alabama. J. M. Robinson (May 26): A bumble flower beetle reported from Citronelle as attacking pear trees.

FLOWER THRIPS (Frankliniella tritici Fitch)

Arizona. E. R. Tinkham (April 16): Just beginning to appear in numbers at Coconino County. Numerous enough to cause injury to peach and apple blossoms (April 28): Late-appearing apple blossoms at Sedona killed by attack. (May 7): Attacking blackberry blossoms in large numbers at Sedona and causing heavy damage; control attempted. Greater part of the strawberry crop on a farm at Sedona destroyed by thrips, probably this species. The only blossoms reported resulted from the first flowers of the season.

TENT CATERPILLARS (Malacosoma spp.)

Washington. L. G. Smith (April 28): Damage in Whatcom County expected to be extensive to apple, cherry, and alder trees this year. Many apple trees are infested with caterpillars and tents before the leaves were out very much. Reported from Snohomish County on April 22 that caterpillars were beginning to hatch and crawl from the nests. Some webbing found.

Oregon. S. M. Dohanian (April 28): In orchards located in northwestern Lincoln County 160 acres of prunes entirely defoliated by M. pluvialis Dyar; near peach orchard and occasional apple trees partially defoliated; and insects now invading raspberry patch, swarms being seen on first two rows but little feeding noted. Not much trouble given before, so far as known.

SAY'S BLISTER BEETLE (Pomphopoea sayi Lec.)

Ohio. J. N. Knull (May 8): Specimens received from Belmont and Muskingum Counties on April 27. Devouring blossom buds and new leaves of plum, cherry, and peach trees. Reported from only one farm in each county.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

New York. E. P. Felt (May 23): Reported as occurring in great abundance on plum at East Patchogue.

Ohio. G. A. Runner (May 24): Winter mortality apparently unimportant in north Ohio.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Alabama. J. M. Robinson (May 26): Found on quince trees at Birmingham on May 26.

PACIFIC MITE (Tetranychus pacificus McG.)

Washington. J. B. Moore (April 28): Eggs reported as found in the Wenatchee Experiment Station orchards on April 24.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (May 20): Pupation began in overwintering cages and the orchard at Poughkeepsie on May 5. No adults have emerged.



- Virginia. A. M. Woodside (May 22): Moths first caught in bait traps at Staunton on May 8 and began to emerge in the insectary on the same day. Oviposition proceeding rapidly.
- Georgia. J. E. Webb, Jr. (May 23): Peak of emergence of overwintered moths occurred at Cornelia about the middle of May. Light egg deposition owing to cool, rainy weather, indicating a light first brood of larvae.
- Ohio. T. H. Parks (May): First moths taken in bait traps at South Point, southern Ohio, on May 8 and at Delaware, central Ohio, on May 19, about the normal time for adults to emerge.
- Indiana. L. F. Steiner (May 23): In the Vincennes area spring-brood moths began emerging on May 6, and activity well bunched, with peak flight extending from May 18 to 22. Tree examinations showed that 79 percent of the brood had pupated and 41 percent emerged by May 17, with 89-percent pupation and 68-percent emergence on May 22. Carry-over in most orchards about normal.
- Kentucky. W. A. Price (May 23): Adults began emerging at Paducah on May 3, and emergence was heavy by the middle of May. At that time most of the overwintered larvae had pupated in the vicinities of Paducah and Princeton. First adults found at Lexington on May 19.
- Michigan. R. Hutson (May 24): About 50-percent pupated at Saint Joseph.
- Wisconsin. C. L. Fluke (May 19): Some larvae have not pupated. Trees in Crawford County now ready for treatment but moths are apparently very late.
- Missouri and Kansas. H. Baker (May): Orchard checks indicate that 11 percent of the overwintered larvae in northeastern Kansas and northwestern Missouri had pupated by April 21, and 50 percent by May 3. First moths caught in bait traps on May 10, and bait-trap catches heavy since May 15. No eggs found in an examination made on May 12, and only a few on May 17.
- Missouri. L. Haseman (May 24): Owing to the peculiar spring, emergence of overwintered generation pretty well bunched over the State. From the north to the south records indicate a difference of only a few days in the peak of spring moth emergence, ranging from around May 17 to May 23 and 24.
- Kansas. H. R. Bryson (May 27): Abundant in Doniphan County on May 25, as well as in other localities.
- Oregon. B. G. Thompson (May 17): Now active and more eggs deposited during the last 6 days than in normal years. Egg laying began about 2 weeks earlier than in a normal season in the Willamette Valley. (May 19): Many larvae found under bark on trees have not pupated.
- Washington. E. J. Newcomer and E. R. Van Leeuwen (May 18): Continued warm weather has brought out large numbers of moths in the Yakima Valley, and nightly bait catches high, reaching a maximum on May 12 to 14. First eggs found on May 1 and first larvae on May 15.

EASTERN TENT CATERPILLAR (Malacosoma americana F.).

- Maine. F. H. Lathrop (May 10): Small nests noticed in wild cherry trees along roadsides in Kennebec County. Nests apparently about as numerous as last year.
- Vermont. H. L. Bailey (May 26): Infestation irregular. Extremely heavy in sections, particularly in Washington County, central Vermont. Lighter than last year over a considerable area. Hatching first noted at Montpelier on May 7.
- Massachusetts. A. I. Bourne (May 23): Found hatching in Amherst on May 3-4. Observations in Plymouth County showed first larvae appearing about May 1. Along roadsides webs were beginning to be quite conspicuous but, although numerous, apparently not quite so abundant as last year or the year before.
- New York. E. P. Felt (May 23): Somewhat common in New York State west to Syracuse.
- R. E. Horsey (May 23): Although a considerable number of nests are to be seen, especially along neglected fence rows of wild cherry and apple, there are not as many nests at Rochester as in the last 2 years. Observed on Japanese quince, crab apple, and cherry.
- New Jersey. F. A. Soraci (May 5): Very abundant in spots in New Jersey, south of a line from Phillipsburg to Elizabeth. Practically no injury in the northern part of the State. Hatching began about April 18 in the Trenton area. Attacking mostly Prunus sp.
- Pennsylvania. C. W. Collins (May 22): Present in considerable numbers on wild cherry in one or two localized areas in the northern part of Bucks County the first week of May.
- Virginia. A. M. Woodside (May 22): Most of the wild cherry trees in the vicinity of Danville defoliated by May 5. Much less common in the Shenandoah Valley.
- South Carolina. F. Sherman and W. C. Nettles (May 22): Less numerous than usual on orchard trees.
- Michigan. R. Hutson (May 24): Very numerous about Saginaw, Harrisville, Cadillac, Muskegon, Shelby, Hesperia, and Clare.
- Wisconsin. H. J. MacAloney (May 16): Common on pin cherry (Prunus pennsylvanica) along fence rows in eastern Wisconsin. Near Milwaukee tents and caterpillars larger than at the Menominee Indian Reservation, 40 miles north. This is due to the more advanced stage of foliation.
- Correction: The apple tree tent caterpillar reported by S. F. Bailey in Insect Pest Survey Bulletin, May 1, 1939, page 89, is M. californica Pack., instead M. americana F.



FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

- New York. N. Y. State Coll. Agr. News Letter (May): Appearing in orchards in the lower Hudson Valley and in the lake district.
- Pennsylvania. H. E. Hodgkiss (May 18): Found on apple in Clinton County on May 10 and in Juniata County on May 9.
- Illinois. W. P. Flint (May 26): Serious damage continues to be caused in the western part of the State; well distributed over southern and north-central Illinois. Larvae about half grown.
- Missouri. L. Haseman (May 24): Again observed in unusually heavy numbers, and older larvae now approaching maturity. Unusually large amount of fruit on the tree being attacked by larvae and treatments have not checked them. Although only eastern Missouri was heavily involved last year, it is reported from southeastern Missouri that forest trees seem more heavily infested than orchard trees, but some damage to fruit expected.

PISTOL CASEBEARER (Coleophora malivorella Riley)

- Pennsylvania. H. E. Hodgkiss (May 18): Migration to apple foliage progressing rapidly in Adams County on April 20. Leaf feeding extensive.

EYE-SPOTTED BUDMOTH (Spilonota ocellana D. & S.)

- Maine. F. H. Lathrop (May 10): A few young larvae found attacking apple buds at Monmouth, Kennebec County, on May 10.
- New York. N. Y. State Coll. Agr. News Letter (May): Apparently abundant in the lower Hudson Valley and also on the lake.

TENTIFORM LEAF MINER (Ornix geminatella Pack.)

- New York. N. Y. State Coll. Agr. News Letter (May 8): Moths reported as beginning to emerge in an apple orchard near Milton, Hudson Valley, near the end of April. Examination of overwintering pupae indicates a parasitization of 44 percent.

APPLE FLEA WEEVIL (Rhynchaemus pallicornis Say)

- Pennsylvania. H. E. Hodgkiss (May 18): A rather extensive infestation found in an apple orchard near New Castle, Lawrence County, on May 11.
- Michigan. R. Hutson (May 24): Infestation reported from Eau Claire.

APHIDS (Aphidae)

- Maine. F. H. Lathrop (May 10): A few newly hatched nymphs of green apple aphid (Aphis pomi Deg.) found at Monmouth. Apparently considerable mortality of eggs during the last winter and this species is very scarce this spring. (May 15): Newly hatched nymphs of the apple grain aphid (Rhopalosiphum prunifoliae Fitch) occurred on developing apple buds in larger numbers than has been observed for 5 or 10 years. Outbreak observed as far north as Monmouth; in



fewer numbers at Jefferson, Lincoln County; and in greater numbers southward through York County. At Monmouth nymphs hatched in large numbers between May 4 and 7. More advanced aphids in York County now in the third instar. No adults observed. Number of aphids on developing buds now reduced, owing to prolonged cool weather and natural enemies. No nymphs of rosy aphid (Anuraphis roseus Baker) observed.

Vermont. H. L. Bailey (May 26): A. pomi very abundant on opening apple buds at Montpelier and Waitsfield on May 5.

New York. M. D. Leonard (May 21): A substantial infestation of apple aphids (A. roseus and R. prunifoliae) on apple first noted on May 12 at Flushing. May leaves starting to curl. By now Adalia bipunctata L. and syrphid larvae are apparently almost cleaned up the aphids on a number of apple trees in the York World's Fair grounds at Flushing.

N. Y. State Coll. Agr. News Letter (May): In a trip through the Hudson Valley from April 25 to 29 aphid infestation found to be the heaviest in years. In the southern and central parts of the valley orchards were observed having more than 100 aphids on a single bud. Predominant species were grain and green aphids. (May 22): Heavy population of grain and green aphids reported in western New York the first of the month. By the middle of May aphids were observed to be multiplying rapidly in the Hudson Valley. By May 8, in Niagara County rosy aphids had been observed as far more numerous on the buds close to the trunks than on the outsides of the trees. Dozens of buds inside had nothing but rosy aphids and outside none. As high as 16 found per bud, but outnumbered by other aphids in total numbers.

New Jersey. E. Kostal (May 2): Rosy and other apple aphids relatively scarce in growth in prepink and pink stages at Morganville, Monmouth County.

Georgia. J. E. Webb, Jr. (May 23): Cool, damp spring has resulted in the most severe rosy apple aphid injury in apple orchards in northern Georgia in years. Still present in limited numbers. Damage from 10 to 30 percent in many orchards.

Indiana. L. F. Steiner (May 4): No A. pomi observed at Vincennes. (May 11): Only a few apple grain aphids remain in the orchards in the Vincennes area. (May 23): Rosy apple aphid, almost impossible to find early in May, has increased during the last 2 weeks to such an extent that damage will be more severe in some orchards than in 1938.

Michigan. R. Hutson (May 24): Apple grain aphids extremely numerous all over the State. Alates just appearing.

Wisconsin. C. L. Fluke (May 19): Winged forms of apple grain aphid appeared on May 18, the most severe attack the writer has ever seen in Wisconsin. Very general over the entire State.

Missouri. L. Haseman (May 24): Very few complaints received and in central Missouri only an occasional tree shows any evidence of rosy aphids. Reported as showing up to some extent in northeastern Missouri in practically all orchards. Predators feeding heavily on them, so no great damage expected.

Missouri and Kansas. H. Baker (May 20): Rosy, green, and grain apple aphids very scarce in orchards in northeastern Kansas and northwestern Missouri.

Arkansas. D. Isely (May 23): Injury by rosy apple aphid began to be obvious in northwestern Arkansas during the week beginning May 15.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Pennsylvania. H. E. Hodgkiss (May 18): Eggs fairly abundant on apple in Lancaster County on April 19.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

New York. D. W. Hamilton (May 20): A few adults found in bait traps in apple trees two-thirds of a mile away from peaches on May 20 at Poughkeepsie.

D. M. Daniel (May 27): First twig injury noticed on May 26, rather late for the locality of Geneva.

Georgia. O. I. Snapp (May 19): Practically full-grown first-generation larvae found in peach twigs at Fort Valley, central Georgia, on April 25. First twig injury in 1938 was on March 29. Infestation this year less than that of an average year.

Indiana. L. F. Steinger (May 11): Adults appearing in traps in apple orchards in the Vincennes area since April 28. Most of these traps located not less than  $\frac{1}{2}$  mile from the nearest peach trees. Total caught since May 1 is 135.

Missouri. L. Haseman (May 24): Peak of spring-brood emergence on May 1 in southeastern Missouri, according to report. Heaviest emergence recorded between April 24 and May 8. A few of the first-brood larvae matured and left the twigs around May 16, and a few scattering spring-brood moths were still emerging on May 19.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Arizona. E. R. Tinkham (May 10): Three first-instar larvae of the second generation found on young peaches at Sedona. Damage light at present.

Utah. C. J. Sorenson (May 21): Moderately abundant in Box Elder and Utah Counties. Overwintered brood now in pupal stage.

PEACH BORER (Conopia exitiosa Say)

Nebraska. M. H. Swenk (May 18): Reported from Pawnee County on May 14 as attacking peach trees.

Oklahoma. F. A. Fenton (May 22): Reported from Colbert, Bryan County.



PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (May 15): Adults began emerging from hibernation in experimental cages at Monmouth on May 2. Emergence slow, owing to cool weather. Apparently a heavy winter mortality in the experimental cages, as compared with the two preceding winters.

Virginia. A. M. Woodside (May 22): Abundant in the region around Crozet, but not common in the Waynesboro section. Oviposition started in the insectary at Staunton on May 8. Half-grown larvae found in peaches now.

Georgia. O. I. Snapp (May 19): Infestation at Fort Valley heavier than that of an average year. Peak of Hiley drop on April 23 and of Elberta on April 2. Peak of emergence of larvae from drops on April 29 at Fort Valley. In one case, 5,162 larvae reared from 3 pecks of drops collected on April 17 and in a local orchard, representing an infestation of about 86 percent. No such heavy drop infestation known before this year, although this orchard was heavily infested last year and may represent more than the average infestation here. First pupation of the season recorded on May 12 in the orchard and May 18 in the laboratory. This is a week later than last year but 2 weeks earlier than in 1937, and a second attack is expected this year.

J. E. Webb, Jr. (May 23): A fairly heavy drop at Cornelia, and peak of first-generation larvae emerging from drops apparently being reached this week.

Ohio. T. H. Parks (May 16): Only three punctures found on cherry and plum fruits in an orchard examined in Delaware County. No serious injury reported from southern Ohio.

Kentucky. W. A. Price (May 23): More abundant than usual in peach orchards in western Kentucky.

Illinois. W. P. Flint (May 26): Very abundant in southern Illinois. More than five times as many taken in jarring as from the same trees in 1938.

Missouri. L. Haseman (May 24): Heavy damage reported in uncultivated and uncared-for orchards in southeastern Missouri, but not generally serious in that area.

Kansas. H. R. Bryson (May 25): Evidence of injury to plums at Manhattan.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Virginia. C. R. Willey (May 22): Hatching at Richmond probably began on May 1 or 18, as none found on May 13, but quite a lot had hatched on a mulberry examined on May 20.

CHERRY

BLACK CHERRY APHID (Myzus cerasi F.)

New York. N. Y. State Coll. Agr. News Letter (May): Reported in some abundance in Columbia County and in considerable abundance in western New York.



Utah. G. F. Knowlton (May 20): Extremely abundant on apical leaves of young cherry trees at Farmington.

### PLUM

#### RUSTY PLUM APHID (Hysteroneura setariae Thos.)

Mississippi. C. Lyle (May 23): Specimens received from Jefferson, Marshall, Rankin, and Tallahatchie Counties, where plum trees were being injured.

Louisiana. O. I. Snapp (May 11): Heavy infestation on bearing plum trees at McIntyre, northwestern Louisiana. Severe foliage injury.

Oklahoma. F. A. Fenton (May 22): Brown plum aphid reported on plum in Vinita, Craig County.

#### MEALY PLUM APHID (Hyalopterus arundinis F.)

California. L. M. Smith (May 18): Podabrus spp. present in unusual numbers in prune orchards throughout the Sacramento and San Joaquin Valleys this spring. They effected control of mealy plum aphid, not equaled in the last 30 years.

#### LEAF CRUMPLER (Mineola indigenella Zell.)

Texas. R. K. Fletcher (May 22): Reported from Matagorda County on plum on May 10.

#### PEAR THRIPS (Taeniothrips inconsequens Uzel)

Oregon. S. C. Jones (May): Prune thrips now full-grown larvae in the Willamette and Umpqua Valleys. Most larvae have entered the soil.

#### TERRAPIN SCALE (Lecanium nigrifasciatum Perg.)

Oklahoma. F. A. Fenton (May 22): Reported as seriously damaging plum at Muskogee, Muskogee County.

### RASPBERRY

#### RASPBERRY FRUITWORM (Byturus unicolor Say)

New York. N. Y. State Coll. Agr. News Letter (May 22): Numerous in some raspberry plantings in the lower Hudson Valley.

Ohio. E. W. Mendenhall (May 26): Very bad on blackcap raspberries in Fairfield County.

Washington. L. G. Smith (May 5): Adults brought in on April 19 from the Puyallup district, the first ones noted this season.

W. W. Baker and B. J. Landis (May 20): Adults found on thimbleberry 1 mile south of Kelso, Cowlitz County, on May 4.

Oregon. W. W. Baker and B. J. Landis (May 20): Adults found 3 miles south of Goble, Columbia County, on May 5, apparently the first record of this species in western Oregon.

RASPBERRY ROOT BORER (Bembecia marginata Harr.)

Idaho. W. E. Shull (May 10): Local severe infestations reported at Hailey.

Washington. H. J. Wood (May 23): Active from May 5 to 15 in the Spokane Valley, and apparently more in evidence this year than in previous seasons. Found in the larval stage.

RASPBERRY CANE MAGGOT (Pegomya rubivora Coq.)

Washington. L. G. Smith (May 23): Severe infestation around Renton and Kirkland, King County, boysenberries and noctarberries being attacked. Apparently a greater amount of damage than heretofore. Infested tips of black raspberries sent in from Snohomish.

CURRENT

CURRENT FRUITFLY (Epochra canadensis Loew)

Washington. R. F. Kern (April 28): Emergence noted on April 17 around Sumner and Puyallup, a gradual build-up following to April 24.

IMPORTED CURRENT WORM (Pteronidea ribesii Scop.)

Nebraska. D. B. Whelan (May 18): Both eggs and half-grown larvae found on currants and gooseberries at Lincoln on May 7.

GRAPE

GRAPE FLEA BEETLE (Altica chalybea Ill.)

New York. N. Y. State Coll. Agr. News Letter (May 22): Observed doing considerable damage to grapes in Erie County, western New York, on May 18.

Ohio. J. S. Houser (May 12): Rather widespread damage caused in a 5-acre vineyard located near a woodland at Canton. Developing buds hollowed out by adults.

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

Ohio. E. W. Mendenhall (May 26): Quite badly infesting grapes in and around Columbus.

GRAPE BERRY MOTM (Polychrosis viteana Clem.)

Ohio. G. A. Runner (May 24): Emergence of adults in field cages in vineyards near Sandusky began during the fourth week in May, the time being about the average of previous years. Only a few moths have emerged, this early emergence of a small percentage of the total before the blossoming period of grapes being normal for the overwintered brood.



LEAFHOPPERS (Cicadellidae)

- Ohio. G. A. Runner (May 24): Overwintered adults of grape leafhoppers began feeding on grape foliage in the Sandusky area during the third week in May. Large numbers still congregated about green plants in vineyards, especially on chickweed and dandelion. Counts from a collection from grape on May 23 showed that 62 percent were the three-banded grape leafhopper (E. tricincta cymbium McA.). E. comes Say was next in abundance. Five species altogether represented in the collection.
- Utah. G. F. Knowlton (April 29): E. comes survived the winter in large numbers in Utah County, and small nymphs are already appearing in some vineyards. Adults increasing in abundance upon Virginia creeper and some still scattered upon miscellaneous vegetation. Grape leafhoppers seriously spotting and bleaching strawberry and raspberry foliage near grapes in a field north of Farmington. Only a few present on the small grape leaves in this vineyard.
- Washington. L. G. Smith (May 5): Request for control information as to grape leafhoppers received from Zillah, in the Yakima Valley.
- Arizona. E. R. Tinkham (May 8): Considerable numbers of adults of Dikraneura cockerellii Gill. present in grape orchards 3 miles south of Sedona, but no larvae.

ONION THRIPS (Thrips tabaci Lind.)

- California. S. F. Bailey (May 25): Specimens sent from Calipatria, Imperial County, on April 25. Damage severe locally; dropping of blossoms caused and small fruit injured.

A MITE (Tetranychus willamettei McG.)

- California. L. M. Smith (May 18): Unusual numbers occurring on grapes, at Vernalis, San Joaquin County, this spring. (Det. by E. A. McGregor.)

PECAN

A TORTRICID (Cacoecia infumatana Zell.)

- Louisiana. K. L. Cockerham (May 2): First noticed this year on May 1 as seriously defoliating large seedling pecan trees at Opelousas, southwestern Louisiana. Supposed to be a new pecan pest in the State. Very serious pest at Opelousas last year. Large trees completely defoliated and covered, both trunk and limbs, with a silvery sheen. With injury beginning so early in the season, severe damage is expected. (Det. by H. W. Capps.)

APHIDS (Phylloxera spp.)

- Mississippi. C. Lyle (May 23): Pecan leaves with many phylloxera galls received from Amite County. Practically every leaf on a 10-year-old tree reported as infested. Pecan twigs infested with P. devastatrix Perg. received from Humphreys County on May 20.



Texas. R. K. Fletcher (May 22): Pecan phylloxera, probably P. caryaecaulis Fitch reported from Matagorda County on May 10; from Galveston County on May 8; and from Colorado County on May 17.

# WALNUT

## A SPITTLEBUG (Cercopidae)

Arizona. E. R. Tinkham (May 20): Very small nymphs found attacking small English walnuts in material sent in from Oak Creek Canyon, 8 miles north of Sedon. Damage slight but increasing, and may be considerable later.

# CITRUS

## CITRUS THRIPS (Scirtothrips citri Moul.)

California. S. F. Bailey (May 25): Grapes in a vineyard adjoining a grapefruit orchard at Indio, Riverside County, severely attacked; leaves curled and shoots killed early in May.

## CALIFORNIA RED SCALE (Aonidiella aurantii Mask.)

Arizona. C. D. Lebert (May 8): Two grapefruit found in a packing plant at Phoenix moderately infested. Fruit in storage from a February picking and grove infestation not yet found.

## COTTONY CUSHION SCALE (Icerya purchasi Mask.)

Arizona. C. D. Lebert (May 20): Heavy infestations observed this month on ornamentals in Phoenix, Mesa, and Tucson. Slight increase in citrus infestations and no parasites found. Several colonies of vedalia beetles placed at present with hopes of control soon.

## CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Florida. H. T. Fernald (May 22): Adults just beginning to appear on citrus at Winter Park, near Orlando; possibly the second generation.

Mississippi. C. Lyle (May 23): Specimens on Cape-jasmine received from Adams County; reported from Copiah County.

## GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. H. T. Fernald (May 12): Alate individuals appearing in large numbers on citrus at Winter Park.

# OLIVE

## BRANCH AND TWIG BORER (Polycan confertus Lec.)

California. P. Simmons (May 12): Adults reported as damaging twigs of olive in an orchard at Fresno. Specimens and injured twigs submitted.

## T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

South Carolina. W. C. Nettles (May 22): More abundant in the State during the winter than previously.

C. F. Rainwater (May 24): Two specimens collected around hibernation cages of the boll weevil at Florence. (Det. by L. L. Buchanan.)

Mississippi. C. Lyle (May 23): Adults received from Yazoo County on April 29.

Arkansas. D. Isely (May 23): Injury recorded from Lincoln County, southeastern Arkansas, during the first week in May.

CUCUMBER BEETLES (Diabrotica spp.)

New York. N. Y. State Coll. Agr. News Letter (May 15): A few twelve-spotted cucumber beetles (D. duodecimpunctata F.) jarred from apple, pear, and plum trees in western part of Suffolk County; not observed in vegetable garden.

South Carolina. J. G. Watts (May): D. balteata Lec. slightly more abundant at Blackville than at this time last year. Although injury not observed on many crops, beetle was seen on potatoes, corn, cucumbers, snap beans, lima beans, and various wild plants. Adults of D. duodecimpunctata numerous on a wide variety of plants throughout the month. Damage to cucumbers decidedly less than last year, even with the large numbers present. In addition to cucumbers, injury was observed on lima beans, snap beans, lettuce, gladiolus, cotton, turnips, and onions.

Ohio. N. F. Howard (May 23): One D. duodecimpunctata found on tomato at South Point.

FLEA BEETLES (Halticinae)

New York. N. Y. State Coll. Agr. News Letter (May 22): Cabbage flea beetles (Phyllotreta vittata F.) generally destructive to cabbage, especially in Wayne County, western New York. Flea beetles numerous and destructive to cauliflower, cabbage, and beets in Genesee, Orleans, and Niagara Counties, western New York. Potato flea beetle (Epitrix cucumeris Harr.) first observed in Suffolk County on tomatoes in coldframes, and more abundant and injurious to tomato in the western part of the county.

Nebraska. M. E. Swenk and D. B. Whelan (May 18): Western cabbage flea beetle (Phyllotreta pusilla Horn) found attacking radish plants in Hamilton County on May 5; reported on radishes at Lincoln during the first 3 weeks of May.

Kansas. H. R. Bryson (May 25): Considerable injury caused to radishes.

Idaho. L. G. Smith (May 5): Reported as injuring radish and cabbage seedlings in gardens at Moscow.

Utah. G. F. Knowlton (May 24): Serious injury caused to cabbage and peppers at Saint George on May 8. Tomatoes reported as severely damaged in gardens at Logan on May 18 and 24.

H. E. Dorst (May 20): Not serious on beets in northern Utah; damaging young tomato plants in some areas. Abundant on garden crops, such as radishes and turnips.

#### BLISTER BEETLES (*Meloidae*)

Florida. J. R. Watson (May 23): Blister beetles, particularly *Epicauta cinerea* Forst., abundant during the last month, attacking blossoms of Dahoon holly, potatoes, tomatoes, and many wild plants.

#### FALSE CHINCH BUG (*Nysius ericae* Schill.)

Nebraska. D. B. Whelan (May 18): Reported as present on spinach at Lincoln on May 17.

Montana. H. B. Mills (May 20): Abundant in spots on reversions growing up to Russian-thistle near Havre. On May 15 there were 40 nymphs per square foot in some areas. Very few adults.

#### FIELD CRICKET (*Gryllus assimilis* F.)

California. A. E. Michelbacher (May 20): Rather destructive to tomatoes in several places in Alameda County. Areas of serious damage rather limited and, so far as known, confined to the area adjacent to Dublin.

#### GARDEN CENTIPEDE (*Scutigera immaculata* Newp.)

Utah. G. F. Knowlton (April 29): Seed and germinating plants of peas, corn, carrots, parsnips, and other garden plants damaged in Utah County. Pest apparently gradually becoming more widely distributed in northern Utah.

California. R. Cecil (May 17): Feeding on lima bean seedlings at Ventura has reduced the stand approximately 25 percent on 160- and 20-acre fields examined. Numerous reports of poor stands apparently caused by same pest. Cool weather has retarded germination of beans planted early, favoring attack.

#### POTATO AND TOMATO

#### TOMATO PINWORM (*Gnorimoschema lycopersicella* Busck)

Florida. J. R. Watson (May 23): Abundant on tomatoes in Manatee County.



Arizona. C. D. Lebert (May 18): Light infestation found in two tomato fields northeast of Mesa. No other plantings within 5 or 6 miles. No other infestations located in the main tomato-growing area of Maricopa County. Damage slight. Two fields in the Lehi area, northeast of Mesa, moderately infested.

California. J. C. Elmore (May 18): Numerous on leaves of tomato vines in a few fields in the San Pedro hills, near where last year's vines survived the winter.

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New York. M. D. Leonard (May 22): Adults reported as numerous at Roslyn, L. I., and eggs abundant now. Adults first noticed at least 2 weeks ago and eggs a week ago.

Virginia. H. G. Walker and L. D. Anderson (May 27): About normally abundant in the Norfolk area.

South Carolina. W. C. Nettles (May 22): Abundance indicated by the amount of control operations, more than in other years.

J. G. Watts (May 23): Numerous complaints received of extensive injury to potatoes in the area around Blackville. More reports than usual of injury to tomatoes.

Florida. J. R. Watson (May 23): Common on tomatoes in Alachua County.

F. S. Chamberlin (May 9): Rather abundant on potatoes in Gadsden County.

Ohio. R. H. Nelson (May 15): Adults numerous on early potato and tomato plants near South Point since May 1. Egg masses noted on both but more common on potato. (May 19): First larvae observed hatching in the week of May 16.

Iowa. H. E. Jaques (May): Observed in Monroe County.

Missouri. L. Haseman (May 24): During May large numbers of adults suddenly appeared at Columbia, feeding and ovipositing and, since May 20, newly hatched larvae have been feeding heavily on potatoes not properly treated.

Nebraska. D. B. Whelan (May 18): Eggs and adults noted at Lincoln.

Idaho. J. R. Douglass (May 15): Finding of ~~an overwintered~~ beetle reported near the western edge of the Twin Falls irrigation tract on May 12. Few of these beetles found there last season and infestation cleaned up.

Washington. L. G. Smith (May 23): Beetles feeding on volunteer potatoes in fields near Thorp, Kittitas County, on May 20. Planted potatoes just coming through the ground.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

- New York. M. D. Leonard (May 22): Numerous in a large planting at Roslyn, L. I., on potatoes about 3 inches high. Leaves had 10 to 15 holes each.
- Virginia. H. G. Walker and L. D. Anderson (May 27): Very abundant in some sections of Accomac County.
- Indiana. J. J. Davis (May 24): Flea beetles, probably this species, responsible for damage to newly set eggplant and tomatoes at Logansport on May 23.
- Washington. T. A. Knoblauch (May 23): Plants in the locality of Arlington, Snohomish County, show many eastern potato flea beetles and a few western species.

R. De Grave (May 23): Heavy infestation of western potato flea beetles (E. subcrinita Lec.) reported as attacking any host plants available in the Kittitas Valley with serious damage. Control operations under way on May 15.

DARKLING GROUND BEETLES (Tenebrionidae)

- California. A. E. Michelbacher (May 20): Serious damage by darkling ground beetles to newly set out tomato plants in Alameda County, injury ranging from about 2 to over 50 percent.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

- Virginia. H. G. Walker and L. D. Anderson (May 27): Reported as becoming moderately abundant in potato fields in Princess Anne County.

POTATO APHID (Macrosiphum solanifolii Ashm.)

- Virginia. H. G. Walker and L. D. Anderson (May 27): Appearing in small numbers in potato fields in the Norfolk area.

POTATO AND TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

- Arizona. C. D. Lebert (May 18): A rather heavy infestation found in a field in the Mesa-Lehi area. No damage noticeable.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

- New York. N. Y. State Coll. Agr. News Letter (May 15): A few beetles jarred from fruit trees in western Suffolk County. Evidently just out of hibernation, but not observed in the vegetable garden.
- South Carolina. J. G. Watts (May 1): First specimen of the year seen at Blackville in flight.

Georgia. D. E. Read (May 26): Slight damage to cucumber foliage, and all varieties of beans attacked at Thomasville.

T. L. Bissell (May 11): A number of egg clusters found on May 8 at Experiment, central Georgia. Insect not abundant. (May 22): Adults emerging from hibernation and becoming abundant.

Florida. J. R. Watson (May 23): Heavy infestation reported at Havana, Gadsden County, near the Georgia line.

Alabama. J. M. Robinson (May 26): Abundant at Clayton and Auburn.

Ohio. R. H. Nelson (May 11): First adult found on beans near South Point. Nine fields sampled and only one beetle found.

H. C. Mason (May 16): First adult observed at Columbus was feeding on beans at the Ohio State University Farm today.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. H. G. Walker and L. D. Anderson (May 27): Unusually abundant and has done a great amount of feeding in many early bean fields in the Norfolk area.

South Carolina. F. Sherman and W. C. Nettles (May 22): Present and observed, but probably not abnormally abundant.

J. G. Watts (May 23): Rather extensive damage to young plants throughout the month at Blackville. Snap beans, lima beans, and soybeans attacked. Serious damage limited to small garden plantings, usually those not treated, no appreciable damage being observed on commercial plantings.

Georgia. T. L. Bissell (May 11): Damage heavy in one field of beans at Experiment.

Ohio. R. H. Nelson (May 10): Adults found injuring seed leaves of young bean plants near South Point. Serious injury observed in only one field.

Kentucky. W. A. Price (May 23): Considerable damage to string beans caused during May.

Missouri. L. Haseman (May 24): Reported as causing considerable damage to all varieties of beans during the last 2 weeks in the Cape Girardeau area, southeastern Missouri.

PEAS

PEA WEEVIL (Bruchus pisorum L.)

Idaho. T. A. Brindley (May 23): Large numbers emerged in Moscow on May 13 and 14, as recorded by cage and flight-trap studies.



Oregon. D. C. Mote (May 19): Peak of migration into fields from hibernation reached on May 8 in the Willamette Valley. A few taken in decreasing numbers, during the rest of the week. Control operations were begun prior to May 8 on canning peas and on May 15 on Austrian winter field peas.

Washington. L. G. Smith (May 23): Reported from Walla Walla County on May 15. Adults congregated on the border of a pea field near Dixie and averaged 5 per sweep of net; field just coming into bloom. In Walla Walla and Columbia Counties the first eggs were noted on May 9 on volunteer peas. A few found in the fields for some time but first large emergence in hibernation cages and first appearance in numbers in the fields occurred during the hot period of May 13-15.

PEA APHID (Macrosiphum pisi Kltb.)

New York. N. Y. State Coll. Agr. News Letter (May 22): Pea aphids found in Suffolk County on about 10 percent of pea plants, with an estimated population of about 20 aphids per 100 plants. In Nassau County they are slowly increasing in abundance but still relatively scarce .

H. Glasgow (May 28): Pea aphid has been moving into peas for the last week or 10 days at Geneva. Much more abundant than at this time last year.

Maryland. E. N. Cory (April 26): Reported as present in small numbers in pea fields near Cambridge.

Gertrude Myers (May 26): Abundant on canning peas near Rockville, Montgomery County. Spraying being done.

Virginia. H. G. Walker and L. D. Anderson (May 27): Early market garden peas in Norfolk and Princess Anne Counties uninjured. However, canning peas on the Eastern Shore of Virginia are heavily infested and peas are seriously damaged where proper control measures were not applied.

Nebraska. M. H. Swenk (May 18): Early garden peas attacked and injured in Valley County on May 11.

Washington. L. G. Smith (May 23): Average of 50 or more taken per sweep in a peafield near Dixie, Walla Walla County, on May 15. An abundance of syrphid fly larvae and eggs present, but very few ladybeetles.

CABBAGE

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Utah. G. F. Knowlton (May 13): Moths abundant at Utah Hot Springs. Larvae and moths extremely abundant on white-top, a weed, at Silver City and Eureka.

CABBAGE WEBWORM (Hellula undalis F.)

Louisiana. P. K. Harrison (May 12): First larvae collected on mustard on May 10 at Baton Rouge. Larvae about one-fifth grown.

CABBAGE MAGGOT (Hylemya brassicae Bouche)

Connecticut. N. Turner (May 23): Eggs appeared early in May at Hamden. Evidences of large population, but larvae developing slowly.

New York. N. Y. State Coll. Agr. News Letter (May 22): Abundant on Long Island, where maggots were reported by the third week in May. By that time eggs were numerous in the Niagara district.

H. Glasgow (May 27): Egg laying has about reached its peak at Geneva.

Virginia. C. R. Willey (May 22): Reported on May 15 that nearly all of a planting of early cabbage was destroyed at Floyd, Floyd County. Damaged plants and maggots received on May 19. Several pupated on May 22.

Indiana. J. J. Davis (May 24): An early commercial planting of radishes at Logansport was destroyed the last of April.

Idaho. L. G. Smith (May 12): Adults observed resting on seedling cabbage at Moscow on May 3.

Washington. L. G. Smith (May 12): Mature larvae found in radishes in a garden in Whitman County.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Ohio. N. F. Howard (May 23): One found on old kale at South Point.

Indiana. J. J. Davis (May 24): Adults reported as very abundant on horseradish at Aurora on May 22. Large losses to late cabbage and turnip last year also reported.

Kentucky. W. A. Price (May 23): Prevalent in the Louisville area.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Iowa. C. J. Drake (May 26): Reported at Ames, Des Moines, and Olin.

Idaho. J. R. Douglass (May 9): First overwintered squash bug noted in the Twin Falls area today.

Washington. L. G. Smith (May 23): Eggs being laid on volunteer squash growing in pastures south of Pasco, Franklin County. Little squash being grown this year.

MELONS

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

- New York. N. Y. State Coll. Agr. News Letter (May 15): Found near a vegetable garden in western part of Suffolk County on May 9. Numerous beetles observed since then in the orchard while jarring for curculios.
- Ohio. N. F. Howard (May 23): Very numerous in the Scioto bottoms, near Chillicothe, feeding on the cotyledons of wild cucumber. Very numerous and injurious to cucurbits at South Point, some plantings not treated immediately being destroyed as the plants pushed through the ground.
- Georgia. J. E. Webb, Jr. (May 20): Damage to squash and cucumbers severe where noted at Cornelia.

A LEAF MINER (Agromyzidae)

- South Carolina. J. G. Watts (May 10): Large numbers of a small fly, presumably an agromyzid, reared from cotyledons of small cantaloup plants at Blackville. Between 95 and 100 percent of the cotyledons estimated as attacked. Cucumbers and watermelons less extensively attacked.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

- South Carolina. J. G. Watts (May 22): More than normal numbers of adult convergent ladybeetles (Hippodamia convergens Guer.) observed at Blackville consuming large numbers of asparagus beetle eggs. Apparently responsible for keeping this insect in check in one small field of asparagus for 2 or 3 weeks.
- D. Dunavan (May 22): Taken at Clemson, first record for this part of the State.
- Georgia. T. L. Bissell (May 2): Beetles common on some patches of asparagus at Milner.
- Michigan. R. Hutson (May 24): Asparagus beetles very numerous around Mason and Williamston.
- Utah. G. F. Knowlton (May 20): Observed since May 3 damaging asparagus shoots generally throughout Weber County and in northern Davis County. Numerous larvae of all sizes present now in northern Utah localities.



Washington. L. G. Smith (May 5): Six or 8 beetles per stalk reported at Kenneydale, King County. Specimens submitted. (May 23): A survey of several fields on May 18 showed a moderate-to-severe infestation in the Sunnyside locality of Yakima County. Larvae found in abundance but few adults seen.

R. D. Shonefelt (May 16): Found attacking asparagus at Pullman. Not previously reported from this area.

R. S. Lehman (May 20): Very destructive to this year's planting of asparagus at Walla Walla.

ASPARAGUS MINER (Agromyza simplex Loew)

Washington. L. G. Smith (May 23): Many adults found resting on asparagus foliage near Sunnyside, Yakima County, on May 18.

HOPS

HOP APHID (Phorodon humuli Schr.)

Oregon. H. E. Morrison (May 12): Seasonal development in the Willamette Valley is 7 weeks in advance of the 1938 season. Infestation light.

ONIONS

AN APHID (Micromyzus formosanus Takahashi)

Virginia. H. G. Walker and L. D. Anderson (May 27): The aphid reported on page 85 of the May 1 issue of the Insect Pest Survey Bulletin has been identified by P. W. Mason as the above species.

ONION PLANT BUG (Labopidea allii Knight)

Kansas. H. R. Bryson (May 27): Reported on May 23 as causing considerable injury to tops of onions in a number of localities. Not as injurious at Manhattan as last year, possibly owing to good growing conditions for onions.

ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker and L. D. Anderson (May 27): Becoming very abundant on onions and cabbage at Norfolk.

South Carolina. J. G. Watts (May 11): An exceptionally small amount of injury observed in a 7-acre field of onions near Sycamore, Allendale County.

Florida. C. B. Wisecup (March 9): Adults observed on foliage of onions, celery, and potato at Sanford. (Det. by F. Andre.)

Texas. R. E. McDonald (April 11): A considerable amount of cotton now being replanted in the lower Rio Grande Valley, much of it owing to damage by onion thrips.

ONION MAGGOT (Hylemya antiqua Meig.)

Oregon. B. G. Thompson (May 17): Damage in western Oregon more general than last year.

A CURCULIONID (Pnigodes setosus Lec.)

South Dakota. H. C. Severin (May 9): Found doing considerable damage to leaves of radishes and turnip near De Smet. (Det. by L. L. Buchanan.)

Kansas. H. R. Bryson (May 27): Reported on May 15 as causing injury to radishes in Smith County.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (May 23): Discovered in two more counties of Florida, Charlotte, and Hillsboro. In Manatee County, for the first time, noted as doing severe damage to eggplant.

STRAWBERRY

WEEVILS (Brachyrhinus spp.)

Utah. G. F. Knowlton and R. L. Janes (May 6): One adult of B. rugosostriatus Goeze found in strawberry patch at Farmington on May 5. Three adult B. ovatus L. found under refuse in strawberry patch at Mapleton; larvae are damaging roots.

Washington and Oregon. M. J. Forsell (May 11): No overwintering adults of B. sulcatus F. nor B. ovatus found in the Columbia River Valley, Wash., and the Walla Walla River Valley, Umatilla County, Oreg. Larvae and pupae found in the ground as usual.

Washington. E. P. Breakey (April 28): First strawberry root weevil (B. sulcatus and B. ovatus) pupae of the season found on April 26. in Pierce County. About 5 percent in the pupal stage. (May 23): About 95 percent of strawberry root weevils in Pierce County are in the pupal stage. First adult weevil reported as found on May 12.

L. G. Smith (May 12): Severe damage to strawberries by strawberry root weevil (B. sulcatus) reported throughout Snohomish County. Weevils are pupating. First pupa reported on April 28 from a field near Everett.

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Maryland. E. N. Cory (April 26): Considerable damage to strawberries in Pocomoke.

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Oregon. G. R. Ferguson (May 17): Development about 2 weeks advanced over that of the last 2 years in the Willamette Valley. First pupae found on May 13. Injury to strawberries as severe as last year but infestations more general. Injury to flax apparently about the same.

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Iowa. C. J. Drake (May 26): Reported from Plainfield.

Utah. G. F. Knowlton and R. L. Janes (April 29): Adults in fields examined at Logan, River Heights, Providence, and Farmington; most abundant in fields at North Providence.

APHIDS (Aphidae)

Georgia. T. L. Bissell (May 2): Strawberry aphids on the new leaf stems of transplanted plants at Griffin. Ants much in evidence.

Arizona. E. R. Tinkham (April 16): Plants at Sedona, Coconino County, heavily infested by Capitophorus fragaefolii Ckll. (?) and apparently being damaged.

A LYGAEID (Myodocha serripes Oliv.)

Kansas. H. R. Bryson (May 27): Specimen sent in from Moran on May 25; reported as sucking the juices from strawberry fruits.

SUGAR BEETS

BEET WEBWORM (Loxostege sticticalis L.)

Montana. H. B. Mills (May 20): Just beginning to appear as adults throughout northern Montana from May 13 to 15.

Idaho. J. R. Douglass (May 15): A flight of moths reported in the Castelford and Burley neighborhoods on May 10 and 11 respectively.

F. H. Shirck (May 15): Moths found in large numbers in a field of red clover at Homedale, Owyhee County.

Utah. G. F. Knowlton (May 8): A few moths present throughout northern Utah. Extremely abundant in an alfalfa field at Vineyard, Utah County.

C. J. Sorenson (May 21): Adults very abundant in Salt Lake and Utah Counties.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. H. E. Dorst (May 20): Overwintering population in northern Utah



larger in the Promontory Point breeding area than in 1936, 1937, or 1938. Nymphs observed on April 26. Some areas averaging 25 to 30 nymphs per square foot. Long-distance migration of adults observed on May 2. Distinct increase observed on May 15. Long-distance migration of males and females large.

SUGAR-BEET ROOT MAGGOT (Tetanops aldrichi Hendel)

Utah. G. F. Knowlton (May 8): An adult collected at Farmington.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

South Carolina. N. Allen and assistants (May 24): Large numbers emerged in tobacco plant beds in Florence County between May 8 and 20; severe infestations for this time of year occurring in some tobacco fields.

Florida. F. S. Chamberlin (May 26): Infestations in tobacco shade fields much lighter than normal.

Tennessee. L. B. Scott (May 22): Moderately abundant in tobacco plant beds in north-central Tennessee.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. F. S. Chamberlin (May 15): Causing some damage in fields of sun-grown tobacco throughout the Gadsden County area.

TOMATO WORM (Protoparce sexta Johan.)

South Carolina. N. Allen and assistants (May 24): A few eggs and an occasional larva observed on field tobacco plants in Florence County since May 16.

TOBACCO BUDWORM (Heliothis virescens F.)

South Carolina. N. Allen and assistants (May 24): Present on tobacco in Florence County from May 16 to 20 in sufficient numbers to warrant control measures.

CORN ROOT WEBWORM (Crambus caliginosellus Clem.)

Tennessee. L. B. Scott (May 22): Less abundant in north-central Tennessee than for several years. Infestation on wild hosts light to moderate, and it is not expected that this pest will cause serious damage to tobacco.

MUSHROOMS

A MITE (Rhizoglyphus phylloxerae Riley)

Ohio. A. C. Davis (March 30): Collected on mushrooms at Port Clinton in March. (Det. by H. E. Ewing.)

# COTTON INSECTS

## BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy and C. F. Rainwater (May 27): Very active, as the week has been warm in Florence County. A total of 175 weevils removed from cages during the week, as compared to 21 in 1938. Examinations in the field show generally more weevils in the field for the week than in 1938, as follows: 1 to 43 plants in 1939; and 1 to 128 in 1938. Emergence from cages in May totaled 635 this year, as compared to 216 in 1938. Trap-crop and screen-trap catches less than in 1938.

Georgia. P. M. Gilmer and P. A. Glick (May 20): Practically all fields in Dooly, Tift, Cook, Lowndes, Berrien, and Echols Counties show infestation; those planted in the vicinity of old fields quite heavily infested in spots. Fields remote from hibernating quarters or from old cotton have light infestations, averaging from 1 to 3 weevils per 1,000 plants. Average is about 1 to 2 weevils per 500 plants in large fields and from 4 to 6 per 500 in small fields.

Florida. C. S. Rude and L. C. Fife (May 27): Found in several fields in Lake County. Heaviest population noted to date was 17 weevils per 100 plants in a field that was in cotton last season. None found in Lake County in 1938 until about August 1. Many farmers using control measures. Light populations found in each of the fields where experimental plots are located. In treated and untreated fields examined in Alachua County infestation ranged from 0.5 to 78 percent; in Union County from 0 to 10 percent; in Marion County from 2.6 to 27.8 percent; in Gilchrist County from 0.2 to 12.2 percent; and none found in Putnam County. For the same period last year infestation in these counties ranged from 0 to 14 percent, but cotton was not so far advanced as this season. Stub cotton in some old fields is heavily infested.

Mississippi. E. W. Dunnam, et al. (May 27): In Washington County 9 weevils found on 150 cotton plants next to woods. Plants in the 6-leaf stage. This area yields weevils earlier, as cotton is usually seeded earlier than in other fields examined.

Louisiana. R. C. Gaines and assistants (May 27): Weevils removed from hibernation cages in Madison Parish through the week ended May 26 totaled as follows: 311, or 0.89 percent, in 1939; and 310, or 0.89 percent, in 1938. Total taken on field flight screens for the week was 7, as compared with 5 in 1938 and 3 in 1937. Population in fields in Madison Parish has averaged almost the same as in 1938, 194 being found on 41,000 plants inspected, or 1 per 211 plants.

Texas. F. L. Thomas (May 24): Weevils continue to emerge from hibernation quarters and now exceed average survival; already occurring in noticeable numbers near hibernating quarters.



RED-HEADED FLEA BEETLE (Systema hudsonias Forst.)

Louisiana. P. K. Harrison (May 12): Observed as attacking cotton and doing moderate-to-severe damage in the Baton Rouge area. Smartweed, a wild host, was growing on turn rows and also being attacked.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. F. L. Thomas (May 12): First leaf worm of the season found in Cameron County on May 4, a three-fourths-grown larva being collected at San Benito.

R. L. McGarr, et al. (May 20): First record for this season in Calhoun County made on May 17, when two leaf worms were taken from cotton on a farm 7 miles west of Port Lavaca. One larva about full grown.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. H. S. Cavitt (May 27): Total moth emergence somewhat lower than last week. Only 11 moths from winter-buried and irrigated treatments. A big drop in emergence from the cocoon series, 37 as compared with 62 last week. All but 3 moths emerged from cocoons not disturbed following installation of the larvae. Only 3 moths emerged from thurberia bolls this week, as compared to 15 last week. Apparently emergence from these bolls is practically over.

APHIDS (Aphidae)

South Carolina. C. F. Rainwater (May 20): Observations this spring in Florence County have brought out more forcibly than before the fact that Trifidaphis phaseoli Pass. is the most serious root aphid on cotton. Usually a heavy mortality to seedling cotton wherever it occurs. One severely infested field in this vicinity has not more than 25 percent left of the plants that came up.

Arizona. E. R. Tinkham (May 12): Aphis gossypii Glov. quite abundant on cotton at Continental, Pima County, but heavily parasitized.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. F. L. Thomas (May 24): With the exception of a few fields in southern Texas, flea hoppers have not done much damage to early planted cotton. There has been a substantial increase in the numbers of young flea hoppers which practically doubled during the last week in Calhoun County. Hatching of overwintered eggs apparently nearly over in southern Texas, but in central Texas considerable numbers have hatched since the rains. In northern and northwestern Texas the hatch is running into fairly large numbers.



A WHITEFLY (Trialeurodes sp.)

Arizona. T. P. Cassidy (April): Beginning to appear generally on seedling cotton in the Tucson area, but only one field found where infestation is heavy enough to be noticed. No damage reported.

THRIPS (Thysanoptera)

South Carolina. J. G. Watts (May 10): Sericothrips variabilis Beach and Frankliniella fusca Hinds have been doing a little damage to seedling cotton at Blackville, more than in 1938 but less than normal.

C. F. Rainwater (May 20): Thrips appeared suddenly in Florence County. Last week practically none on cotton and this week a heavy infestation. Apparently they came to cotton at the time the first small grain was being harvested.

F. F. Bondy and C. F. Rainwater (May 27): Some damage to young cotton in Florence County, but not severe and less than in 1938.

Mississippi. E. W. Dunnam, et al. (May 27): Of 44 plants examined on May 25 at the experiment station in Washington County, 1 was infested with 1 thrips; on May 26 of 75 plants, 25 were infested with 31 thrips; and of 75 other plants, 19 were infested with 21 thrips.

Texas. F. L. Thomas (May 6): Some damage continuing to cotton in most sections of the State. More abundant than usual in the southern and central parts of Texas since spring began. Early increase, stimulated by the mild winter and the cool, dry weather of the last few weeks, has retarded the growth of cotton so that feeding by thrips has caused leaves to curl and on some plants killed terminal buds.

A CRICKET (Anurogryllus muticus Deg.)

Mississippi. C. Lyle (May 23): Specimens received from Smith County with statement that they were causing injury to corn, cotton, and other plants.

F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

CANKERWORMS (Geometridae)

- Connecticut. E. P. Felt (May 23): Fall cankerworms (Alsophila pometaria Harr.) relatively scarce, although a few have been reported in southern Connecticut.
- Ohio. T. H. Parks (May 22): Spring cankerworms (Paleacrita vernata Peck) and the fall species both very abundant and seriously defoliating elm trees along streams in the central counties of Ohio. Spring cankerworms began hatching the first week of May and the fall cankerworms a few days later.
- Illinois. W. P. Flint (May 26): Outbreak resulted in heavy defoliation of woodland elms and unsprayed apple trees throughout the north-western and west-central parts of Illinois. Thousands of elms and honey locusts in this area almost completely defoliated. Nearly all farm orchards in same condition. Parasites relatively scarce. Larvae through feeding over nearly all the area except the extreme northern part.
- South Dakota. H. C. Severin (May 12): Much trouble at present in Charles Mix and Jackson Counties. At Brookings elm and oak are badly defoliated.
- Iowa. C. J. Drake (May 26): Spring cankerworm extremely abundant throughout most of the southern half of the State, and some infestation here and there in the northern counties. Many elm and apple trees in the vicinity of Des Moines entirely defoliated. Although spring cankerworm by far the dominant species, some fall cankerworms found. More damage done to elm and unsprayed apple trees in southern Iowa than for several years.
- Missouri. L. Haseman (May 24): Spring cankerworm more destructive than ever known before in the Kansas City area, particularly in the country surrounding Columbia, and, judging by reports, in other parts of the State. Dozens of large mature elms completely stripped of foliage. Reported as very serious along the Mississippi River, in northeastern Missouri, with the heaviest infestation in the St. Louis area.
- Nebraska. M. H. Swenk (May 18): Inquiries as to control of spring cankerworm on elm and other shade trees received from Harlan, Douglas, and Otoe Counties on May 5, 8, and 10, respectively.
- Kansas. H. R. Bryson (May 25): More abundant than usual. Injury to elms and apple trees extended almost as far west in the State as apples are grown. Almost complete defoliation in many localities. A smaller population of caterpillars in cities where control work was done last year.



H. B. Hungerford (May 22): Scattered reports of severe local infestation of spring cankerworm at Kansas City; at Lawrence injury is severe in small areas.

J. R. Horton (May 6): Spring cankerworms began to appear in considerable numbers at Wichita almost as soon as the trees began to come into leaf. A large percentage of street and yard elm and maple trees all over the city now almost completely defoliated. Webbing very conspicuous. Similar outbreak last year stopped short of extensive defoliation such as this.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

General. E. P. Felt (May 23): Hatched in southwestern New England, and westerly from Pittsfield, Mass., to Syracuse, N. Y. Probabilities favor serious though spotted injury in this territory.

Vermont. J. V. Schaffner, Jr. (May 23): In Vermont and western Massachusetts, where there have been outbreaks during the last 3 or 4 years, although egg clusters are still very common in many localities, infestation in general has decreased considerably. Counts made in several widely separated localities indicate the average egg deposit in 1938 as 50 percent less than in 1937. Eggs still rather abundant in some localities. Infestation heavy on a great many shade trees in Barre. Hatching was unusually late this year; not general in this area until the first week in May.

Pennsylvania. H. E. Hodgkiss (May 18): Observed on forest trees in Wyoming County on April 26.

South Carolina. W. C. Nettles (May 22): Tupelo gum trees defoliated in the eastern part of the State.

Oregon. S. C. Jones (May 15): In the Tennessee Valley district of Linn, Lane, and Marion Counties, number of tents per prune tree from 17 to 55, averaging more than 30, in April and to the present. Mostly full grown. Some eggs just beginning to hatch, however. The coast tent caterpillar (M. pluvialis Dyar) is the principal species in this district, but the forest tent caterpillar is also present. Parasitization high and many diseased. Other hosts infested are cherry, pear, apple, and filbert. Much more abundant than last year.

GREAT BASIN TENT CATERPILLAR (Malacosoma fragilis Stretch)

California. K. A. Salman (May 13): On April 18 small tents and caterpillars found to be abundant on bitter brush (Purshia tridentata) near Hall's Flat, Lassen County. Last outbreak on this area noted in 1930.

TENT CATERPILLARS (Malacosoma spp.)

Utah. G. F. Knowlton and F. C. Harmston (May 8): Entire groves of trees at Rockville and Springdale, southern Utah, largely stripped of leaves.



G. F. Knowlton (May 15): Willows and plums damaged on farms at Holladay.

GYPSY MOTH (Porthetria dispar L.)

Pennsylvania. A. F. Burgess (May 16): Check-up at and in the vicinity of the infestation northeast of Pittston, in the township of Damascus, Wayne County, recently completed with negative results.

FALL WEBWORM (Hyphantria cunea Drury)

Louisiana. O. I. Snapp (May 11): Nests of half-grown larvae observed on button willow at Minden, northwestern Louisiana.

A GEOMETRID (Lycia ursaria Walk.)

Missouri. L. Haseman (May 24): Reported on May 19 as being quite destructive to foliage of trees in the St. Louis area. Same pest reported as of considerable importance in that area last year. Feeding on foliage of oak, poplar, Chinese elm, and a number of other trees.

FIR FLATHEADED BORER (Melanophila fulvoguttata drummondi Kby.)

California. K. A. Salman (May 13): Two adults removed from open-surface evaporimeters near Cornaz Lake, Shasta County, on April 18. This is an extremely early flight record for this area.

A SCOLYTID (Pterocyclon mali Fitch)

Pennsylvania. E. J. Udine (May 18): Flying in large numbers in woods on March 11 at Doubling Gap, Cumberland County. Reported as attacking hardwoods and apple. (Det. by M. W. Blackman.)

ASH

A SAWFLY (Tomostethus multicinctus Rohw.)

Virginia. R. A. St. George (May 16): Larvae feeding on foliage of young ash tree at Arlington on May 15. (Det. by R. A. Cushman.)

AN APHID (Prociphilus fraxini-dipetalae Essig)

California. K. A. Salman (May 13): Ash trees planted for several miles along the highway east of North Sacramento observed on April 9 as severely injured, new leaves being curled, dried, and shriveled. Abundant on leaves and twigs of the injured trees, but relatively scarce on the less severely injured or uninjured ones. (Det. by E. O. Essig.)

A MIRID (Nooborus illitus Van D.)

California. K. A. Salman (May 13): For several miles along the Lincoln Highway east of North Sacramento ash trees were seen on April 9 to be severely injured, especially the new leaves. The ash bug was abundant on injured leaves and twigs.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

Iowa. C. J. Drake (May 26): Reported as emerging from birch trees in Des Moines. Many birches killed in this city last summer by this borer.

BOXELDER

BOXELDER BUG (Leptocoris trivittatus Say)

Virginia. A. M. Woodside (May 22): Common enough to cause a few complaints.

Indiana. D. W. LaHue (May 23): Large numbers observed flying on April 22 and 23 in the vicinity of La Fayette.

Wisconsin. E. L. Chambers (May 22): Many reports received from the southeastern part of the State.

Iowa. H. E. Jaques (May): Reported in Emmet County, northern Iowa, and Washington and Henry Counties, southeastern Iowa.

Nebraska. M. H. Swenk (May 18): Received from Sarpy County on April 27, and from Saunders County on April 28.

Kansas. H. R. Bryson (May 23): More abundant than last year and indications show that they are returning to their usual abundance. Nymphs numerous and feeding on the fallen seeds of soft maples.

Utah. G. F. Knowlton (May 8): Nymphs becoming abundant throughout northern Utah.

ELM

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Virginia. F. R. Freund (May 22): Larvae feeding on elm at Richmond collected on May 10, pupated on May 11, and emerged on May 22.

A. M. Woodside (May 22): Many young elm trees near Staunton defoliated by some chewing insect.

Nevada. G. G. Schweis (May 19): Investigation of calls about prevalence of black caterpillars on willow and elm trees revealed these larvae.

California. G. H. Kaloostian (May 4): Full-grown caterpillars collected on April 21 at Fresno emerged on May 4 after remaining in the chrysalid stage for 9 days at room temperature.

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

General. E. P. Felt (May 23): Indications in southwestern New England and eastern New York State favorable to general and possibly severe injury.

Vermont. H. L. Bailey (May 26): Adult noted at Winooski, Chittenden County, on May 11 but no evidence of feeding.

Ohio. E. W. Mendenhall (May 26): Evident in Columbus on elm trees.

Utah. G. F. Knowlton (May 5): Adults moderately abundant upon a few young elm trees at Smithfield.

Oregon. D. C. Mote (May 19): Egg laying first observed in the Willamette Valley about May 10. Many egg clusters observed since then. Hatching first observed on about May 17. Very few eggs have hatched.

LARGER ELM LEAF BEETLE (Monocesta coryli Say)

Virginia. L. D. Anderson and H. G. Walker (May 27): Examination of soil under elm trees, which were heavily infested last year at Norfolk, showed that 2 percent are in the larval stage, 91 percent in the pupal stage, and 7 percent have changed to the adult stage in the soil, but none have emerged from the ground. Moles observed feeding on overwintering larvae earlier in the spring.

NATIVE ELM BARK BEETLE (Hylurgopinus rufipes Eich.)

New York. C. W. Collins (May 22): Overwintered adults were beginning to make short brood burrows in elm bark and wood on May 1 in Putnam County. Adults observed in flight in Dutchess County during the week ended May 13, and recently made brood burrows 1 or 2 inches long were noted.

New Jersey. C. W. Collins (May 22): Elm tree felled at Chatham found on May 15 to be heavily attacked, after having been cut for 2 weeks.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Nebraska. M. H. Swenk (May 18): Request for control information received from Lincoln County on April 25.

Utah. G. F. Knowlton (May 18): Elm trees at Smithfield damaged.



LEAFHOPPERS (Cicadellidae)

Utah. G. F. Knowlton (May 12): Nymphs abundant on and damaging foliage of Siberian elm at Butlerville and Draper.

DOUGLAS-FIR

A GALL APHID (Chermes cooleyi Gill.)

Pennsylvania. E. P. Felt (May 23): The alternate generation of the Sitka spruce gall aphid occurs in abundance on some Douglas-fir in the Philadelphia area.

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Colorado. D. DeLeon (May 24): Larvae have already emerged from their hibernacula and are feeding in the opening leaf buds of Douglas-fir in Redstone, Big Thompson, and northern St. Vrain canyons. Defoliation will be much more severe than last year and in areas only lightly defoliated last year, as there is a heavy population of young caterpillars.

HACKBERRY

A GALL INSECT (Pachypsylla celtidis-gemma Riley)

Oklahoma. F. A. Fenton (May 22): Hackberry bud gall reported from Shawnee, Pottawatomie County.

HEMLOCK

HEMLOCK BORER (Melanophila fulvoguttata Harr.)

Wisconsin. H. C. Secrest (May 17): Larvae of all instars, except the first, found on hemlock on the Menominee Indian Reservation. Winter mortality low, about 10 percent of the autumn population. Immature larvae active and feeding. Pupae and adults found in the bark of logs exposed to the sun on log decks. No emergence of adults observed. Pupation on logs and trees in the forest, where more protected from the sun, not nearly as advanced.

A LEAF MINER (Recurvaria apicitripunctella Clem.)

Wisconsin. H. J. MacAloney (May 17): Caterpillars found webbing hemlock leaves on May 17 on the Menominee Indian Reservation. Injury not serious.

LARCH

LARCH CASEBEARER (Coleophora laricella Hbn.)

Connecticut. E. P. Felt (May 23): Found in considerable numbers in Westport, and here and there in the southwestern part of the State.

Wisconsin. H. J. MacAloney (May 17): Infestation on eastern larch light, but caterpillars just beginning to tunnel in the new foliage on the Menominee Indian Reservation.

LINDEN

LINDEN BARK BORER (Chrysoclista linneella Clerck)

General. E. P. Felt (May 23): Injury observed in the Boston area of Massachusetts, at Tarrytown, also on Long Island, N. Y., and probably in the Philadelphia area, Pa. Borer confines its operations to the corky layers of the bark, not entering the cambium.

LIVE OAK

RHINOCEROS BEETLE (Dynastes titys L.)

Florida. H. T. Fernald (May 22): Three cocoons submitted on February 10, taken from the decayed heart of a live oak. Material mostly decayed wood. Beetles nearly ready to emerge.

LOCUST

LOCUST BORER (Cyllene robiniae Forst.)

Washington. H. J. Wood (May 23): On May 10 in the northern part of Spokane larvae were just entering the cambium layer and black locust trees were covered with wet and frothy spots; about 1 week earlier than last year.

MAPLE

MAPLE BLADDER GALL (Phyllocoptes quadripes Shim.)

Connecticut. E. P. Felt (May 23): Locally numerous at Stamford.

New York. E. P. Felt (May 23): Found in abundance on soft maple at Southampton, Long Island.

Michigan. R. Hutson (May 24): First specimen received today from Wayne.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (May 24): Abundant in northern Indiana, as evidenced by copious deposits of honeydew from soft maple trees. Evidences of destructive abundance received from as far south as Crawfordsvillo, in the central part of the State.

OAK

A TUSSOCK MOTH (Olene sp.)

Connecticut. E. P. Felt (May 25): Dark tussock caterpillars, probably

O. atomaria Walk., seen feeding in numbers on oak at Stamford, and have practically defoliated the lower half of small white and red oaks along roadsides.

A GALL INSECT (Andricus coronus Beutm.)

Maryland. E. N. Cory (May 8): Galls reported on oak at Chevy Chase.  
(Det. by E. P. Felt.)

A MIDGE (Lasioptera querciperda Felt)

Connecticut. E. P. Felt (May 23): Work of oak twig midge observed on oak at Stamford. It presumably occurs in small numbers in many localities.

WALKINGSTICKS (Phasmidae)

Louisiana. T. E. Snyder (May 12): Infestation of a large number of brown walkingsticks observed just outside New Orleans, at Gentilly. Apparently feeding on nearby oak trees and invading several houses in large numbers. Mating.

PINE

A WEEVIL (Hyllobius radialis Buch.)

Massachusetts. J. V. Schaffner, Jr. (May 22): In a mixed pine plantation of some 5 or 6 acres planted about 15 years ago at Weston, about 40 percent of the trees were blown down in the hurricane of last September. Most of the trees had been girdled, or nearly so, by borers. Most of the infested trees were Scotch pine. Larvae nearly full grown on May 5. Two other inquiries received in May.

A BARK BEETLE (Pityophthorus confinis Lec.)

California. K. A. Salman (May 13): Near Glass Mountain, Modoc County, ponderosa pine reproduction suffered severe winter injury during the last winter. Needles of 1938 growth and thin-barked parts of plants the only parts injured. On April 14 adults were found infesting both injured and uninjured parts.

A WEEVIL (Pachylobius plicivorus Germ.)

Mississippi. C. Lyle (May 23): Adults sent in from Newton County where they were injuring pine.

PANDORA MOTH (Coloradia pandora Blake)

Colorado. N. D. Wygant (May 19): No apparent winter mortality occurred among the small larvae overwintering on the branches of lodgepole pine at Hot Sulphur Springs, on the Arapaho National Forest. Feeding has just started for the season and a few larvae



have changed to the third instar.

A PINE NEEDLE MINER (Paralochia pinifoliella Chamb.)

Massachusetts. J. V. Schaffner, Jr. (May 19): Heavy infestations noted on May 17 in natural stands of pitch pine in Hampden County and the southern part of Worcester County, south-central Massachusetts.

A SAWFLY (Acantholyda erythrocephala L.)

Pennsylvania. E. P. Felt (May 23): Young false pine webworms, possibly this species, reported from Radnor, Delaware County, in sufficient numbers to indicate serious injury within a short time.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Virginia. F. R. Freund (May 16): Collected on mugho pine on May 15; began hatching today.

Maryland. E. N. Cory (April 26): Very heavy infestation on pine in Baltimore.

Nebraska. M. H. Swenk (May 18): Found attacking spruce trees in Perkins County on May 4.

Utah. G. F. Knowlton (May 18): Common upon pine and spruce needles at Smithfield and Logan.

SPRUCE

A NEEDLE MINER (Taniva albolineana Kearf.)

Wisconsin. E. L. Chambers (May 22): Specimens of spruce needle miner received from Marshfield with a request for control information.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

New England. E. P. Felt (May 23): Generally prevalent in the southern New England area.

Pennsylvania. E. P. Felt (May 23): Enormous numbers found on arbutus and spruce in the Philadelphia area, and somewhat common on shaded hemlock foliage.

E. J. Udine (May 18): Abundant on spruce at Carlisle.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

THRIPS (Thysanoptera)

Florida. E. W. Berger and G. B. Merrill (May 25): Cuban laurel thrips (Gynaikothrips uzeli Zimm.) on a species of Ficus were sent in from Daytona Beach on April 7 and from Englewood on March 31, localities on opposite sides of the State.

C. B. Wisecup (March 9): Adults, Frankliniella cephalica Crawf., collected on flowers of citrus at Sanford. Also collected on statice and snapdragon flowers. (Det. by F. Andre.)

Indiana. J. J. Davis (May 24): Taeniothrips simplex Morison reported on gladiolus corms from many sections of the State.

Kansas. H. R. Bryson (May 24): Nymphs and adults observed causing leaf injury to Virginia creeper at Manhattan.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

District of Columbia. C. A. Weigol (May 4): Specimens collected on peony in Washington on April 19. (Det. by H. Morrison.)

Idaho. W. E. Shull (May 5): Infestation on all fruits and ornamentals rapidly increasing in northern Idaho. Damage severe.

South Dakota. H. C. Severin (May 12): Reported as injurious in many areas in eastern South Dakota.

EUONYMUS SCALE (Chionaspis euonymi Comst.)

New York. E. P. Felt (May 23): Reported as abundant at Farmingdale, Long Island, on Pachistima.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Utah. G. F. Knowlton (May 9): Reported as damaging Virginia creeper vines at Antimony.

SOFT SCALE (Coccus hesperidum L.)

Virginia. C. R. Willey (May 10): Collected on English holly at Norfolk. (Det. by H. Morrison.)

AN APHID (Myzus sp.)

New Jersey. M. D. Leonard (Correction): The aphids reported on nine-bark in the Insect Pest Survey Bulletin, May 1, 1939, page 95, were collected on May 12, 1938.

MOLE CRICKETS (Scapteriscus spp.)

Florida. H. T. Fernald (May 22): Observed attacking lawns at Winter Park. More abundant than usual.

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

Maryland. E. N. Cory (May 22): Reported on arborvitae at Hagerstown, Pikesville, and Catonsville.

AZALEA

MULBERRY WHITEFLY (Tetraleurodes mori Quaint.)

Virginia. F. R. Freund (May 11): Adults observed on azalea at Richmond.

A MEALYBUG (Eriococcus azaleae (Const.))

District of Columbia. H. Buckholder (May 19): Infesting azalea around the Pan American Union Building. (Det. by H. Morrison.)

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

Virginia. A. M. Woodside (May 22): Very common around Staunton, and some plantings severely damaged.

CAMPHOR

CAMPHOR SCALE (Pseudaonidia duplex Ckll.)

Louisiana. T. E. Snyder (May): Quite a few small camphor trees in parks and on city streets at New Orleans have light yellow foliage.

GRAPEMYRTLE

GRAPE COLASPIS (Colaspis brunnea F.)

Louisiana. P. K. Harrison (May 31): At Baton Rouge young growth attacked, preventing plants from setting flower buds.

FIRETHORN

A MITE (Paratetranychus ilicis McG.)

California. L. M. Smith (May 18): Observed overwintering as adults, young, and eggs on *Pyracantha* at San Jose. (Det. by E. A. McGregor.)



HOLLY

HOLLY LEAF MINER (Phytomyza ilicis Curt.)

Virginia. C. R. Willey (May): Two parasites reared from holly leaf miner at Richmond were Sympiesis felti Crawford. (Det. by A. B. Gahan) and Opius striativentris Gahan (Det. by C. F. W. Muesebeck). Holly collected in Richmond.

Ohio. J. S. Houser (May 4): Last year's mines from which adults had emerged this spring observed on Ilex glabra at Youngstown and Cleveland. A serious infestation.

A WHITEFLY (Aleuroplatus plumosus Quaint.)

Virginia. G. T. French (May 2): Collected on holly at Richmond. (Det. by Louise M. Russell.)

WALNUT SCALE (Aspidiotus juglans-regiae Comst.)

Virginia. C. R. Willey (May 10): Found on Japanese holly at Norfolk. (Det. by H. Morrison.)

HOLLYHOCK

A CHRYSOMELID (Calligrapha signioidea Lec.)

Utah. G. F. Knowlton (May 19): Adults seriously damaging foliage of hollyhock at Brigham City. (May 24): Reports of repeated injury to foliage of hollyhock received from Logan during the last week. (Det. by H. S. Barber.)

JUNIPER AND CEDAR

A MIDGE (Contarinia sp.)

Nebraska. M. H. Swenk (May 18): Complaints of damage to cedar trees last year from Dodge, Rock, and Redwillow Counties.

D. B. Whelan (May 18): First adult juniper midges emerged in a cage at Lincoln on May 8.

LILAC

LILAC BORER (Podosesia syringae Harr.)

Wisconsin. E. L. Chambers (May 22): Specimens from lilac sent in from Racine and Watertown.

MAGNOLIA

A SCALE (Toumeyella turgida Ckll.)

Mississippi. C. Lyle (May 23): Specimens of this scale on magnolia received from Hancock, Pike, and Wilkinson Counties.

MATRIMONY VINE

A PSYLLID (Paratrioza cockerelli Sulc.)

Arizona. V. E. Romney (April 21): Collected on Lycium sp. 5 miles west of Bylas. (Det. by P. W. Oman.)

PHLOX

PHLOX PLANT BUG (Lopidea davisi Knight)

Virginia. C. R. Willey (May 22): Observed in some gardens in northern Virginia. Nymphs collected at Woodstock on May 16; considerable damage done to young tip leaves. Other damage observed at Woodstock, Winchester, and Boyce.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

Virginia. F. R. Freund (May 15): Collected at Richmond.

A LEAF MINER (Lyonetia latistrigella Wlsm.)

Massachusetts. E. P. Felt (May 23): Work of a leaf miner, probably this species, received from eastern Massachusetts. Material did not indicate serious injury.

ROSE

ROSE SAWFLY (Caliroa aethiops F.)

Indiana. J. J. Davis (May 24): Unusually abundant in many places in Indiana.

Kansas. H. R. Bryson (May 24): Abundant on rose bushes and causing considerable injury.

BRISTLY ROSE SLUG (Cladius isomerus Nort.)

Ohio. E. W. Mendenhall (May 26): Quite bad in rose plants in and around Columbus.

Missouri. A. C. Burrill (May 16): Adults on leaves of roses at Jefferson City; slugs also present. Slight damage.

A BORER (Agrilus rubicola Abeille de Perrin)

Wisconsin. E. L. Chambers (May 22): Rose bushes seriously injured by rose stem borer throughout the State.

ROSE LEAF BEETLE (Nodonota puncticollis Say)

Maryland. J. A. Hyslop (May 31): This beetle seriously damaged the flowers of peony and iris the last week of May at Silver Spring. As many as 50 beetles were found in a single rose.

ROSE APHID (Macrosiphum rosae L.)

Indiana. J. J. Davis (May 24): Reported as unusually abundant in many sections of the State.

Wisconsin. E. L. Chambers (May 22): Early roses generally infested in the southern part of the State. No mortality from rains.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

South Carolina. W. C. Nettles (May 22): Reported as damaging roses in Sumter County.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Utah. G. F. Knowlton (May 15): Collected while injuring rose bushes at Delta. (Det. by H. Morrison.)

SNOWBALL

BEAN APHID (Aphis rumicis L.)

New York. (M. D. Loeanrd (May 21): Infestation has been building up on several snowball shrubs in Jackson Heights, Long Island, for 2 or 3 weeks, and many terminal shoots badly infested and leaves curled. Alates numerous. Infestation now being checked by Adalia bipunctata and some syrphid fly larvae.

Utah. G. F. Knowlton (May 12): Reported as damaging snowball terminal leaves and blossoms at American Fork, Draper, Logan, Sandy, and Salt Lake City.

SNOWBALL APHID (Aphis viburnicola Gill.)

Wisconsin. E. L. Chambers (May 22): American snowball bushes, wherever grown in southern Wisconsin, heavily infested. Japanese varieties apparently immune.

Utah. G. F. Knowlton (May 12): Reported as injuring terminal leaves and blossoms of snowball at American Fork, Draper, Logan, Sandy, and Salt Lake City.



INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

- Vermont. H. L. Bailey (May 26): Larvae and pupae still abundant in flood-water pools and swampy land at Leicester, Rutland County, western Vermont, on May 25. Some adults on the wing.
- Wisconsin. E. L. Chambers (May 22): Just beginning to appear in sufficient numbers to attract attention. Reported as quite numerous following recent rains.
- Utah. G. F. Knowlton (May 20): Reported on May 13 as annoying at Utah Hot Springs Delta, and Oasis. Very annoying to man and livestock in the fields west of Utah Hot Springs, in Weber and Box Elder Counties.
- Washington and Oregon. H. H. Stage (May 15): First larvae of Aedes vexans Meig. and A. lateralis Meig. in floodwater of the Columbia and Willamette Rivers. Washington and Oregon occurred the first week in May, when the flood stage exceeded 10 feet.

SANDFLIES (Culicoides spp.)

- Maryland. E. C. Cushing (May 24): Considerable annoyance began in yards and houses around Silver Spring about May 10 and continues to the present, although the numbers appear to be decreasing.
- District of Columbia. E. C. Cushing (May 25): Reported as troublesome in certain parts of the District of Columbia and suburban areas.
- Oklahoma. F. A. Fenton (May 22): Blood sucking ridge reported on animals at Oklahoma City, Oklahoma County.

A DEERFLY (Chrysops fuliginosa Wied.)

- Maryland. H. L. Dozier (May 22): First species found abundant at Cambridge along marsh edge from May 20 to 22. (Det. by A. Stone.)

AMERICAN DOG TICK (Dermacentor variabilis Say)

- Massachusetts. C. N. Smith (May 22): Unusually abundant in many parts of southern Massachusetts. Adults are between three and four times as numerous as last year on Martha's Vineyard and Cape Cod. Excessive numbers of engorged nymphs believed to have been produced on the unusually large numbers of meadow mice last summer, resulting in the increased adult population this spring.
- New Jersey. J. L. King (May 31): More ticks observed than in previous years.

Pennsylvania. J. L. King (May 31): Spotted fever apparently well established in the Philadelphia area, three cases having been reported this spring in newspapers.

Maryland, District of Columbia, and Virginia. F. C. Bishopp (May 25): Reported as unusually abundant in this area.

Virginia. H. G. Walker (May 8): Collected in Norfolk, where they were reported as very troublesome. (Det. by H. E. Ewing.)

Georgia. A. L. Brody (May 20): Engorged females collected from sheep and steers at Valdosta on May 11 and 18. Average of five ticks per animal found.

Nebraska. M. H. Srenk (May 18): Found in clothing of a man in Lincoln County. Specimens received on April 25. Found on a dog at Lincoln, Lancaster County, on May 6.

#### ROCKY MOUNTAIN SPOTTED FEVER TICK (Dermacentor andersoni Stiles)

Utah. G. F. Knowlton (May 18): Found twice this spring on an insect net after use in the field. A few cases of spotted fever reported in northern Utah.

#### FLEAS (Siphonaptera)

Iowa. C. J. Drake (May 26): At Red Oak the tropical rat flea was found in dwellings infested with rats. It has been taken in a number of different places in Iowa during the last several years.

#### TROPICAL RAT MITE (Liponyssus bacoti Hirst)

South Carolina. F. C. Bishopp (May 20): Taken from a building in Charleston. (Det. by H. E. Ewing.)

Mississippi. C. Lyle (May 23): Received from Hinds County where they were found in a house, and from Warren County where they were collected in a warehouse.

Louisiana. T. E. Snyder (May 5): Collected from an office building in New Orleans. (Det. by H. E. Ewing.)

Iowa. C. J. Drake (May 26): Found in dwellings at Red Oak, infested with rats.

#### CATTLE

#### SCREWORM (Cochliomyia americana C. & P.)

Georgia. E. E. Rogers (April 25): Found on a calf at Valdosta.

A. L. Brody (May 20): Reported on April 28 that cases had occurred almost every week throughout the winter on a farm 6 miles from Valdosta. On May 14 hogs in Echols County were reported as heavily infested the month before, but not from December through February.



J. C. Foster (May 12): Worse in the last month than ever before at Blanton. At least 25 cows treated recently.

Florida. E. E. Rogers (May 10-12): A survey through Madison, Jefferson, Taylor, Lafayette, Dixie, Suwannee, Columbia, and Hamilton Counties indicated the screwworm as having overwintered in northern Florida, and as increasing in numbers.

Texas. R. Melvin (April 27): On April 23 ten 3- to 4-day-old larvae collected from a calf 15 miles south of Menard. Two infestations and 15 unhatched eggs found on April 26 on 44 head of calves examined at Menard. When the animals were examined on April 23, 5 cases of true screwworms were found to the owner. Determined that at least 1 of these cases was C. americana and that larvae were 5 to 6 days old when killed. Although numerous cases reported, these are the only authentic records available.

STABLEFLY (Stomoxys calcitrans L.)

Florida. F. C. Bishopp (May 5): Along the western coast of Florida, in Gulf, Franklin, Bay, and Walton Counties, little annoyance. Number per cow or horse ranged from 0 to 10 on the limited number of animals observed.

Iowa. R. W. Wells (May 20): Observed at Ames on May 19, but only two seen on one cow.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody and E. E. Rogers (May 20): Increasing in numbers during the last month at Valdosta. About 300 to 500 per animal is the average. Considerable injury noted on 1 cow.

Iowa. R. W. Wells (May 20): Observed on cattle at Ames about May 10, and on May 19 of serious annoyance to a cow. Approximately 300 feeding on the animal and considerable injury observed.

NORTHERN CATTLE GRUB (Hypoderma bovis Deg.)

Nevada. J. D. Dangberg (May 25): Many specimens received this spring, with reports of their being more numerous than heretofore in the locality of Minden. (Note by F. C. Bishopp: Reported on July 1, 1938, and an adult sent in later in the year. Species not previously known to occur south of Montana and Oregon, and is evidently spreading in the western part of the country.)

LONE STAR TICK (Amblyomma americanum L.)

South Carolina. W. C. Nettles (May 22): Presumably the worst infestation in 20 years along the coast; hogs and cattle heavily infested in Dorchester and Berkeley Counties. (Det. by Helen L. Trembley.)



GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody (May 20): Unengorged males and females collected from sheep, goats, and cattle at Valdosta on May 11 and 18.

HORSE

BOTFLIES (Gasterophilus spp.)

Missouri. L. Hasegan (May 24): G. haemorrhoidalis L. taken for the first time this year at Columbia, reared from specimens collected from horses coming from Nebraska. Adults have been emerging since May 15. (April 27): Specimens of full-fed throat botfly larvae (G. nasalis L.) taken since the middle of April. Earliest collected ones showing evidence of pupating.

Nebraska. H. O. Schroeder (May 20): From 160 horses examined at Fort Robinson on May 17, 56 larvae of nose botfly were taken.

Utah. G. F. Knowlton (May 20): Larvae extremely abundant in two horses at Farmington, recently brought in from Blue Creek, Box Elder County.

BLACK FLIES (Simuliidae)

Missouri. G. D. Jones (May 10): A serious attack broke out in some of the river-valley sections of southeastern Missouri this spring, the worst for several years. Several animals died. Flies appeared suddenly and lasted only a few days.

POULTRY

EUROPEAN CHICKEN FLEA (Ceratophyllus gallinae Schr.)

New York. R. Matheson (May 10): Quite abundant on poultry at Syracuse.

SHEEP

SHEEP BOTFLY (Oestrus ovis L.)

Georgia. A. L. Brody (May 20): Adults active at Valdosta during late April and the first week of May, when sheep were very nervous and irritated. Since May 11 sheep less affected.

SHEEP TICK (Melophagus ovinus L.)

Iowa. H. E. Jaques (May): Reported from Winneshiek County, northeastern Iowa, and Monroe County, southern Iowa.

# HOUSEHOLD AND STORED-PRODUCTS INSECTS

## ANTS (Formicidae)

- Connecticut. N. Turner (May 23): Lasius interjectus Mayr unusually abundant southern Connecticut. Winged females seen in many houses.
- Pennsylvania. E. J. Udine (May 20): Lawn ants more abundant than usual at Carlisle. Many requests for information.
- Maryland. E. N. Cory (May 22): Pavement ant (Tetramorium caespitum L.) reported in lawns in Baltimore County.
- Virginia. H. G. Walker and L. D. Anderson (May 27): Reported as very abundant in lawns and houses at Norfolk.
- North Carolina. R. A. St. George (May): Male flying Argentine ants (Iridomyrmex humilis Mayr) collected as they came from the side of a residence at Wilmington. (Det. by M. R. Smith.)
- Mississippi. C. Lyle (May 23): Specimens of Argentine ant sent from Simpson County. Reported from Jones, Tallahatchie, and Washington Counties. Fire ants, Solenopsis xyloni McCook, received from Claiborne County; reported nesting in a flower bed; and also reported from Lee, Monroe, and Pike Counties in gardens and flower beds. Specimens of Camponotus caryae rasilis Wheeler received from Lowndes County, with information that they were found in a house.
- Louisiana. P. K. Harrison (May 31): At Baton Rouge fire ants, S. geninata F., tunnelled the stems of dahlias and ate the foliage.
- Indiana. J. J. Davis (May 24): Ants in lawns abundant throughout the State.
- Wisconsin. E. L. Chambers (May 22): Both the common dark brown ant (Crematogaster lineolata Say) and the carpenter ant (Camponotus herculeanus L.) very abundant now in lawns in southern Wisconsin.
- Iowa. C. J. Drake (May 26): Basement ants found in cellars of buildings at Ottumwa, Webster City, Des Moines, Manson, and Alton.
- South Dakota. H. C. Severin (May 12): Several species have given trouble in houses, gardens, and lawns.
- Nebraska. M. H. Swenk (May 18): Mound-building prairie ant (Pogonomyrmex occidentalis Cress.) reported as working in a dooryard in Keyapaha County on May 18.
- Utah. G. F. Knowlton (May 18): Numerous reports of annoyance in gardens, houses, and fields received during the last 3 weeks from various parts of northern and central Utah.

TERMITES (Isoptera)

- Delaware. E. N. Cory (May 22): Reported in houses at Annapolis, Baltimore, and Ellicott City.
- North Carolina. Z. P. Metcalf (April 27): Reported as attacking a house at Durham.
- Michigan. R. Hutson (May 24): Reticulitermes flavipes Koll. reported from Hastings, Mason, White Pigeon, Grand Rapids, Grand Ledge, Kalamazoo, Fennville, and Plainwell.
- Minnesota. C. J. Drake (May 26): Heavy infestations reported in Davenport, Fort Madison, Newton, Ogden, Des Moines, and Waterloo. A number of dwellings in Ogden seriously injured.
- Missouri. A. C. Burrill (May 19): First winged emergence of R. flavipes at Jefferson City reported today.
- Nebraska. M. H. Swenk (May 18): Complaint of R. tibialis Banks as infesting a building in Lancaster County received on April 27. Reported as attacking living trees in Furnas and Douglas Counties on April 26 and May 8, respectively.
- Oklahoma. F. A. Fenton (May 22): Reported from many localities scattered over the State.

BROWN-BANDED COCKROACH (Supella supellectilium Serv.)

- South Dakota. H. C. Severin (May 12): Found infesting a dwelling at Brookings; previously reported as present in several dwellings in Sioux Falls.

LEAD CABLE BORER (Scobicia declivis Lec.)

- California. D. F. Barnes and G. H. Kaloostian (May 2): First adult taken at Fresno on March 24 in a rotary net operated in a raisin storage yard. Total taken in April was 32, as compared with 291 for the same period and locality in 1938, as many as 94 being taken in 1 day.

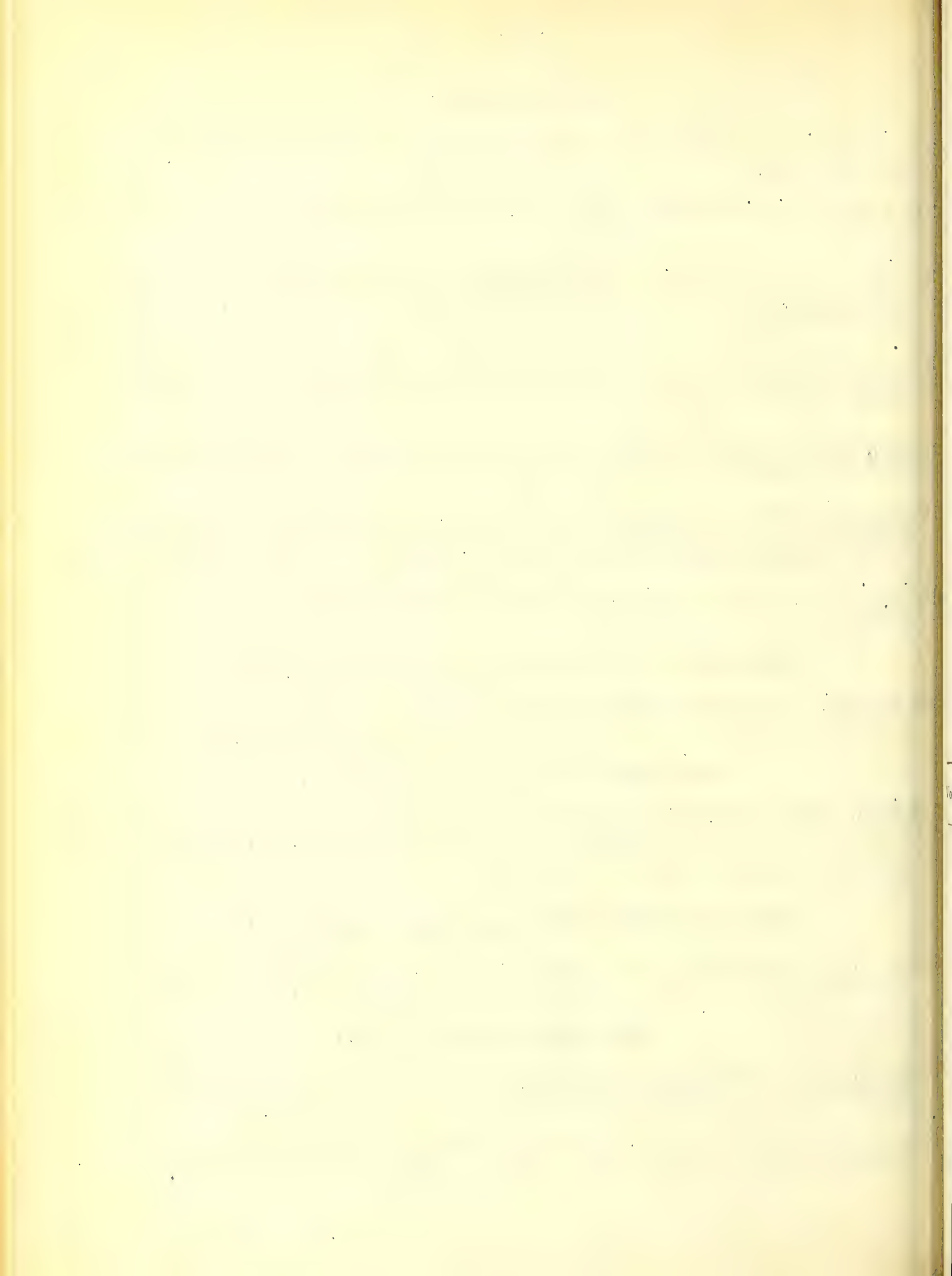
BROAD-HORNED FLOUR BEETLE (Gnathocerus cornutus F.)

- Kansas. T. F. Winburn (April 22): Specimens found in abundance in milling stock in a flour mill in Salina. Species seldom seen in Kansas.

A BEETLE (Duprestis aurulenta L.)

- Washington. A. Z. Smith (May 23): An adult of the aurulent beetle reported as caught boring through flooring in a dwelling in Snohomish County.
- Wisconsin. W. J. Chamberlin (May): Reported in ever increasing numbers until now considered major pest in houses. Damage to woodwork definitely increasing.





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THE INSECT PEST SURVEY  
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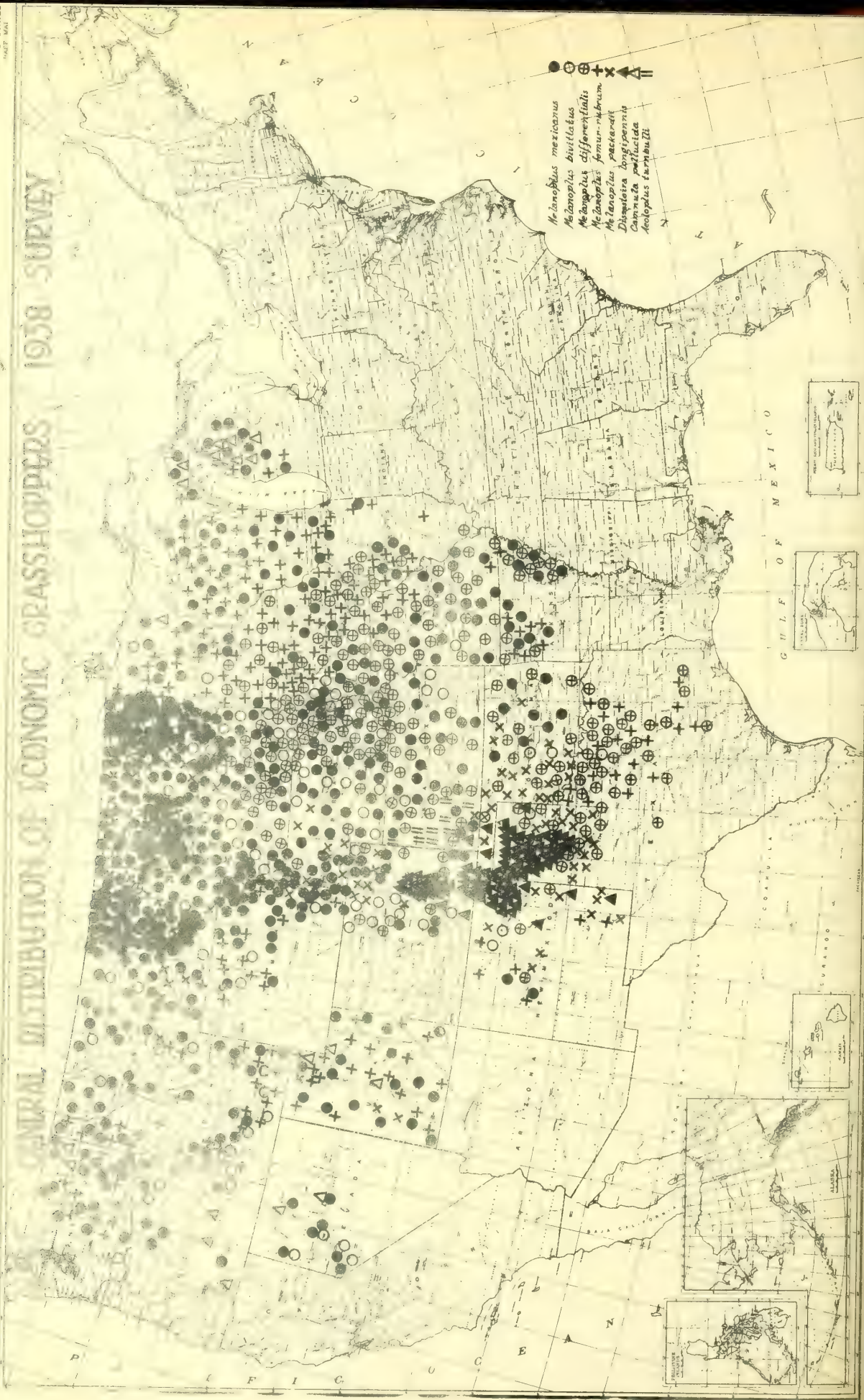
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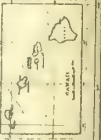


# GENERAL DISTRIBUTION OF ECONOMIC GRASSHOPPERS, 1938 SURVEY



- *Melanoplus mexicanus*
- ⊕ *Melanoplus bivilatus*
- ⊕ *Melanoplus differentialis*
- ⊕ *Melanoplus formicarius*
- ⊕ *Melanoplus pacificus*
- ⊕ *Diplosiphia longipennis*
- ⊕ *Camptocrypta pallidula*
- ⊕ *Acrotylus tenebrosus*

GULF OF MEXICO





## THE SPECIES AND DISTRIBUTION OF GRASSHOPPERS

## IN THE 1938 OUTBREAK

Robert L. Shotwell, Entomologist  
Bureau of Entomology and Plant Quarantine  
United States Department of Agriculture

The year 1938 was the fifth year in which grasshoppers were collected in typical environments in the several States included in the annual grasshopper survey. Data from the 1934, 1935, 1936, and 1937 collections were published as supplements to the Insect Pest Survey Bulletin as follows: Volume 14, number 9; Volume 16, number 5; Volume 17, number 3; and Volume 18, number 6.

The present paper is based on tabulated data from collections made in 21 States, as follows: Arkansas, Colorado, Idaho, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Wisconsin, and Wyoming. Small collections were made in the State of Washington but not of sufficient size to be included in this report. Over 196,000 specimens were taken in the common crops and native habitats of the different States. These specimens have all been identified and recorded as to the numbers of each species in each environment and these data have been recorded for each State as percentages of the total number collected in a single habitat. The identification of these specimens represents an immense amount of work and the credit for this goes to F. E. Snodgrass, field assistant, who has had charge of this work for the last 2 years.

It has been explained in other reports that there are imperfections in the survey and the results are to be considered only in a general way. After 5 years, a study of the results indicates definitely certain trends and changes in the relative abundance of the different species which have been borne out by field observations.

In 1937 Dissosteira longipennis in the Colorado-New Mexico area held the spotlight of interest in grasshopper activities. Again in 1938 this species aroused a greater interest in the States infested including larger areas in the Panhandle of Texas. Of greater import for the entire grasshopper area, however, were the major flights of Melanoplus mexicanus, the



greatest in recent history, which occurred in July 1938 in the Northern Great Plains area. These developed from large reservoirs of this species which hatched out in numbers ranging from 1,000 to 10,000 per square yard in idle and weedy range lands adjacent to cropped fields. These reservoirs were located in large areas of north-central South Dakota, east of the Missouri River, such areas continuing northward into North Dakota and thence diagonally northwestward across that State and in other areas in the southwestern part of North Dakota. The flights were to the northeast, north, northwest, and some southwest, infesting new territory in the Red River Valley of Minnesota and North Dakota, parts of northern North Dakota, a re-infestation in the Mandan to Dickinson areas, including the Bad Lands, the eastern half of Montana, which had no serious infestation to begin with; a large part of extreme eastern Wyoming; and the Black Hills area of western South Dakota.

Nymphal surveys were conducted in the northeastern quarter of South Dakota from May 7 to July 2, inclusive. The high spots of the trend of the grasshopper populations for fields and field margins were as follows:

Date	Population found in--	
	Field	Field margin
	Number	Number
May 7-----	5	35
June 4-----	192	260
June 18-----	190	245
July 2-----	73	119

These are averages of all the observations made in the northeastern quarter in which populations as high as 1,500 per square yard in the field were recorded in some places between June 4 and June 18. There was a general exodus of M. mexicanus from this area the last week of June and the first week of July. This is evidenced in the figures from the nymphal survey which show a sharp decrease of population between June 18 and July 2. This would have been more marked if it had not been for Melanoplus differentialis coming in about this time and holding up the populations to a certain extent.

A similar population trend in eastern Montana was as follows:

Date	Population found in--	
	Field	Field margin
	Number	Number
May 28-----	10	83
June 4-----	18	44
June 18-----	22	80
July 9-----	60	76

There was an increase in average populations which was more marked in a study of the individual observations where counts of 200 and 300 per square yard were common in fields having only 5 per square yard before the grasshoppers flew in. H. B. Mills, State entomologist of Montana, has described the migrations of M. mexicanus into Montana in his report, "Montana Insect Pests for 1937 and 1938" (Rpt. 27, State Ent. Bull. No. 368, pp. 12-16, Jan. 1939). This description is based on observations made by Federal and State men connected with the grasshopper-control program who were checking on the flights. In this article Mills has mapped the spread of M. mexicanus into eastern Montana. Beginning with July 1 in Wibaux, Fallon, and Carter Counties, the crest of the migration moved progressively westward and northwestward until by July 17 it reached into Blaine, Petroleum, and Treasure Counties, or a line north and south 200 miles west of the eastern State boundary. Here the flights terminated and it is in this area that egg deposition was the heaviest. These migrations also extended north into Saskatchewan.

The small farms in the Black Hills of South Dakota also received their share of these migrants. This was evidenced by the high egg counts in this area. All of the eastern counties in Wyoming were also on the receiving end of these migrations. In Goshen County north of Torrington the area invaded by the migration of M. mexicanus shows egg counts of 4 to 16 pods per square foot in the field and 1 field of 29 pods per square foot. Unless conditions unfavorable to grasshopper development occur, this area in 1939 will probably produce as heavy populations as those which developed in north-central and eastern South Dakota in 1938. If this happens then large flights of M. mexicanus can be expected to develop in this area.

The other area where heavy egg deposition occurred from these flights was the reinfested section in the region north and south of a line from Mandan to Medora, N. Dak. Egg predators reduced the number of good eggs 25 to 75 percent, otherwise this would have been the most heavily infested of all the areas. Viable egg pod counts here still run 4 to 16 per square foot.

#### Egg Survey of Range and Idle Land in the Melanoplus mexicanus Area Proper

As a part of the fall grasshopper-egg survey in the Northern Great Plains area infested by M. mexicanus, a separate survey was made of the range and idle land. In this survey only egg pods of this species were considered insofar as it was possible to determine their identity by superficial inspection. The States in which surveys were made were Montana, North Dakota, South Dakota, Wyoming, and the western part of Nebraska. Only a few examinations were made in Nebraska. The survey was divided into two parts, one being done as a special survey made by R. A. Roberts and the other as a part of the regular crop survey made by the district surveyors. Mr. Roberts has written up his report as a separate project for comparison with the reports of the district surveyors.



The method was to examine at least 10 1-square-foot samples of surface soil or sod and record the number of M. mexicanus pods found therein. At each place of examination an average number of pods per square foot was determined and recorded. The range land was arbitrarily divided into two parts. The one part was called adjacent to crop and included all range land within 1 mile of crop land. The other was designated as open range and included all that which was recorded as beyond the 1-mile limit. There were 1,558 fields and range areas examined in both surveys. The results are compiled in tables, which are self-explanatory. So far as possible the number of pods per square foot were recorded for the cropped fields in the vicinity of the range and idle lands observed. The following is an excerpt from the report made by R. A. Roberts summarizing the results of his "Survey of the Range and Idle Lands of the Northern Great Plains Area in Relation to Infestations of Melanoplus mexicanus:"

"The writer made a survey of this territory beginning September 11, 1938, and concluded October 23. Briefly, the survey began at Glendive, Mont., extended southeast to Sully County, S. Dak.; north to Bismarck, N. Dak.; northwest to Plentywood, Mont.; west along the Canadian border to Opheim, Mont.; south to Torrington, Wyo.; east to Alliance, Nebr.; and north to Bowman, N. Dak. Generally speaking the infestation, as indicated by egg deposition, was lightest in the eastern part of the Dakotas, increasing to heavy in central North Dakota and being very heavy along the Canadian line and in eastern Montana. Two heavy areas were found in Wyoming--the Crook-Weston Counties area and the Niobrara area. Idle land appeared to be infested to about the same extent as crop land, although the figures are not so conclusive as those obtained in the general survey. Favored places in idle land consist of land idle about 2 years where black prairie soil has settled firmly. Sandy loam is also favorable. Eggs are frequently deposited under last season's Russian-thistle, this year's Russian-thistle, and Amaranthus (recumbent form). The longer the land lies idle the more nearly it resembles pasture land, being marked by increase in grasses and decrease in weeds. This should lead to a corresponding decrease in the number of M. mexicanus eggs found. The decrease could not be expected until the change in flora has occurred. Range land adjacent to crop land is nearly always overrun by Russian-thistles and it is fairly easy to find egg pods under these weeds. Low-growing, bushy sage clumps were found to be favored locations and many egg pods were found under sage plants. Search in dense sod was very disappointing, more pods being found in light areas of bunchgrass and other western grasses. On open range clumps of sage and occasional weeds appeared to be the best places to search for eggs. An open range area of unusual significance was found in the piney-butte area in Garfield County, Mont., between Fort Peck and Jordan. In this area where no crops were present, stops were made every 5 miles with average egg pods as follows: 0.4, 0.2, 0.8, 1.2, and 0.2. At one of these stops 31 egg pods were found in a single 1-foot-square sample taken under a Russian-thistle by the roadside, but this sample was not counted. Although in general, egg deposition was light on open range, it is obvious that in areas of heavy adult population where no crops are present oviposition will necessarily take place. It is suggested that in the future examinations in these areas be made in sage clumps and other favorable locations."



Table 1.--Summary of 1,394 1-foot-square soil samples showing data pertaining to infestation of *Melanoplus mexicanus*. Samples collected by R. A. Roberts in North Dakota, South Dakota, Montana, Wyoming, and Nebraska, September 11, to October 21, 1938

Kinds of land sampled	Fields sampled Number	Samples Number	Viable Pods Number	Average viable pods per square foot Number	Fields in which no eggs were found Percent	Fields in which some eggs were found Percent	Average good pods per square foot where some eggs were found Number	Beefly destroyed on pods reported		Elister beetles found Number
								Beefly larvae found Number	Percent	
Cropped-----	58	520	520	1.00	16	84	1.12	232	31	49
Idle-----	39	378	270	.71	10	90	.78	79	23	15
Open range-----	16	152	70	.46	31	69	.57	9	11	1
Adjacent range 1/	31	344	146	.42	23	77	.52	70	32	10
Total-----	144	1,394	1,006	0.72	17	83	0.83	390	28	75

1/ Range within 1 mile of crop land.

Table 2.--Summary of 1,558 cropped fields, idle fields, and range areas sampled for grasshopper eggs 1938

Kinds of land sampled	Fields and range areas sampled in--					Mean average pods per sq. ft. sample in					Stops with av. below 0.2 pods per sq. ft.		Stops with av. above 0.2 pods per sq. ft.	
	Mon-tana	Neb-raska	N. Da-kota	S. Da-kota	Wyo-ming	Total	Mon-tana	Neb-raska	N. Da-kota	S. Da-kota	Wyo-ming	Total	Percent	Percent
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	Percent	Percent
Idle-----	200	45	158	118	20	541	1.03	1.65	1.24	0.74	0.90	1.08	--	--
Adjacent range 1/	200	7	88	75	44	414	.54	.77	.49	.29	.26	.45	51	49
Open range-----	210	7	8	44	11	280	.32	1.14	1.19	.13	.21	.34	68	32
Total-----	610	59	254	237	75	1,235	--	--	--	--	--	--	--	--

1/ Range within 1 mile of crop land.

In addition to the data given above, 323 fields and range areas in cropped land adjacent to range were sampled, with a total mean average of 1.13 pods per square-foot sample.

Table 3.---Grasshopper egg survey in idle land in 1938

Ratings	Stops made in---													
	Montana		Nebraska		N. Dak.		S. Dak.		Wyoming		Total		Adjacent to crop land	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.0-----	48	25	1	2	37	23	45	38	3	14	134	25	92	28
1.1-2.0----	48	25	2	5	34	22	21	18	2	10	107	20	50	16
2.1-3.0----	43	22	15	34	30	19	29	24	7	33	124	23	73	25
3.1-4.0----	31	16	16	36	31	20	20	17	8	38	106	20	61	19
4.1-5.0----	25	12	10	23	26	16	4	3	1	5	66	12	47	14
Total-----	195	100	44	100	158	100	119	100	21	100	537	100	323	100

Table 4.--Grasshopper egg survey in range land in 1938

Mean av. pods per square foot	Proportionate rating	Range stops					
		Adjacent range		Open range		Total	
		Number	Percent	Number	Percent	Number	Percent
0 - 0.2---	1	211	51	190	68	401	58
0.3 - 0.5-	2	126	30	49	18	175	25
0.6 - 1.0-	3	45	11	21	7	66	10
1.0 - 2.0-	4	17	4	14	5	31	4
2.0 - 15.0	5	15	4	6	2	21	3
Total---	--	414	100	280	100	694	100



Table 5.--Rangeland survey in 1938. Rangeland acreages classified as to infestation and tons of bait needed for control

Acreage surveyed	Montana	North Dakota	South Dakota	Wyoming	Total
1. Noneconomic-----	24,864,032	7,487,002	12,896,502	14,204,787	59,452,323
2. Light-----	10,905,277	3,075,018	5,843,727	5,770,695	25,594,717
3. Threatening-----	4,362,110	1,871,750	806,031	1,109,749	8,149,640
4. Severe-----	2,181,055	267,393	604,523	1,109,749	4,162,720
5. Very severe-----	1,308,633	668,482	0	0	1,977,115
Total-----	43,621,107	13,369,645	20,150,783	22,194,980	99,336,515
Total to poison (4 plus 5)---	3,489,688	935,875	604,523	1,109,749	6,139,835

Range land classified as to infestation in percentage of total acreages

Infestation	Montana	North Dakota	South Dakota	Wyoming
1. Noneconomic---	57	56	64	64
2. Light-----	25	23	29	26
3. Threatening---	10	14	4	5
4. Severe-----	5	2	3	5
5. Very severe---	3	5	0	0

Tables 1 to 5 show the results of the survey with Mr. Roberts' data summarized in table 1, and tables 2 to 5 giving a summary of all the surveys. In table 2 the average number of egg pods per square foot in idle land is 1.08 and in cropped land adjacent it is 1.13, showing very little difference. In range land there is very little difference between the average infestations in open and adjacent range lands, but considerable difference between any of the range and the cropped or idle land. The infestations in the former were only about one-half to one-third as great as in the latter. The figures given in table 3 show that the percentages of adjacent crop-land areas falling into the 1 to 5 classes of infestation follow very closely the classification of idle land. Comparing such a classification of range land in table 4 with the idle land and cultivated crop in table 3, there is considerable difference. For example, 58 percent of the range can be considered as "noneconomic," or class 1, as it pertains to the migratory species M. mexicanus and its effect on crop land in the immediate vicinity. Only 25 percent of the idle land and 28 percent of the crop falls in this category. In the class 2, or "light," classification there falls 25 percent of the range, 20 percent of the idle land, and 16 percent of the crop land; in the class 3, or "threatening," 10 percent of the range, 25 percent of the idle land, and 23 percent of the crop; in the class 4, or "severe," 4 percent of the range, 20 percent of the idle land, and 19 percent of the crop land. In the class 5 or "very severe," 3 percent of the range, 12 percent of the idle land, and 14 percent of the crop land. This is all based on the number of areas and fields examined.

From the standpoint of estimating control needs on idle land, it could be considered the same as wheat stubble land, where in the average percentage of infestation for a county was applied to the total idle land acreage. Where infested, the egg pods of M. mexicanus are distributed throughout the field in a similar manner to wheat-stubble infestations and there would be little or no chance of their being plowed under before hatching.

In dealing with range land there was no criterion for making estimates of bait needs; therefore, in table 5 a table of percentages of range areas falling into each of the five classes of infestation was set up for each State. This was based on the actual numbers of areas examined in each State. Applying these percentages to the total acreages of range land in each State, classified the range land acreage into the five classes of infestation. From general observations, major migrations, whether by leg or wing, of M. mexicanus to crop land from range land in 1938 occurred in areas where the egg pods averaged over 1 pod per square foot, which means above a class 3 or "threatening" infestation. Therefore, any extra poisoned bait needed for protection from range land could be estimated by considering the acreages falling into the class 4 and class 5 infestations. For the entire area this means a total of 6,139,835 acres, which is 6 percent of the entire range area. It is also believed that only class 5 infestations with egg pods numbering above 2 per square foot will produce major flights to distant areas. Some 1,977,115 acres come into this classification.



In the North Dakota and South Dakota areas of most severe infestation, wherein the great flights of July 1938 originated, the number of egg pods in the 1937 fall survey averaged from 2 to 6 per square foot, with an occasional field averaging from 10 to 15 pods. These numbers of egg pods at an average of 20 eggs per pod would theoretically produce from 300 to 1,000 nymphs per square yard over large areas and, in some instances, from 1,500 to 3,000 per square yard. Estimated populations were reported as high as 8,000. For every 1 field of egg pods at the above rates, the active hoppers hatching from these places could spread over 6 to 60 times the area of the original breeding ground at a population of 50 per square yard. With many places like these, it is no wonder that the large flights developed and similar areas located in the 1938 survey might again produce major flights. Although populations of M. mexicanus in Michigan, Wisconsin, Iowa, and more eastern States may sometimes equal those in the Western Plains area, they do not seem to develop the migratorial habit to the extent that plains grasshoppers do. This greatly reduces the hazard from this species.

#### The Dissosteira longipennis area

On the Western Plains Dissosteira longipennis moved out to the more eastern and southeastern plains area of Colorado, spread over a wider area in the Panhandle of Texas, remained in about the same general area in northeastern New Mexico, occurred on the range land, also in the extreme northwestern third of the most western county in the Panhandle of Oklahoma, and is also an important crop hopper in the rest of the Panhandle area. Here the eggs of this species have been found along field margins, in wind-blown sand ridges, and in the listed rows of sorghum. When egg pods of D. longipennis occur in numbers over 1.5 pods per square foot they are usually in definite egg beds that are sometimes noticeable and sometimes not. These beds run from 1 to 100 acres in size. Some egg deposition occurs between the beds but the numbers of pods are usually 1 or less per square foot. For the most part the egg beds show severe damage to the grass cover, with the grass eaten short by ovipositing females. Spotting these egg beds is essential for good, efficient control of this species. One ranch of 6,000 acres in Union County, N. Mex., had already marked 36 beds of 3 to 10 acres in size. It is believed that approximately 6 percent of the general D. longipennis area contains some egg pods, with concentration on about a third of this. In the regular egg survey it is impossible to locate nearly all the egg beds and determine their acreage. Only the general areas of infestation can be defined and the acreages of these determined. For the entire D. longipennis area this amounted to 11,217,200 acres in the 1938 survey.

#### Species with lesser migratorial tendencies

Attention is called to the map entitled, "General Distribution of Economic Grasshoppers 1938 Survey," where symbols are used to denote the different species. Melanoplus differentialis is the most abundant in southeastern South Dakota, eastern Nebraska, and western Iowa. In Texas it is the dominant crop hopper other than D. longipennis. From the survey



it appears that this species is definitely building up in the south-central part of South Dakota, where in 1931 it destroyed a large portion of the crop in 30,000 square miles. In the egg survey, egg pods numbered as high as 150 per square foot in some places along field margins.

Melanoplus bivittatus is an important species scattered throughout the Great Plains States, but most numerous in parts of South Dakota, Wyoming, Colorado, and Nebraska.

Melanoplus packardii was rated as second in importance in most places where M. mexicanus was so numerous. Some of these may have been M. foedus, which is hardly distinguishable from M. packardii. Both of these species are noticed profusely throughout the Great Plains States in environments typically M. mexicanus.

Melanoplus femur-rubrum is most prominent in parts of Iowa, Wisconsin, Minnesota, Wyoming, Idaho, Utah, and Washington. It is the dominant species in the irrigated alfalfa of Idaho and Utah. Its distribution is very general.

Cannula pellucida is very important in localized areas in Nevada, Oregon, Washington, and Michigan. In the fall of 1938 it reached its greatest abundance in Nevada, where 250 pods per square foot were recorded at 1 stop.

Aeoloplus turnbullii, a common species, was recorded as dominant in four or five counties in the extreme western part of Kansas. It is an important species in sugar beets. Last spring it was found hatching in considerable numbers along the edges of fields in the irrigated sections around Garden City, Kans., and elsewhere. It is unusual for this species to be of such economic importance.

There were other species, such as Aulocara ellicetti, Aganotettix deorum, Brachystola magna, Dissosteira carolina, D. spurcata, Oedaleonotus enigma, Schistocerca sp., and others recorded as numerous and important but not to the extent of those already discussed.

The map has its limitations, because the subject matter is presented in such a graphic manner. The dominant species is considered first in the distribution, and the second in importance is shown occasionally. Where two or more species are of equal importance they are shown by an equal number of each of their symbols. Relative abundance is but roughly indicated in the numbers of each symbol and the map should not be taken too literally.

#### Effect of weather on the 1938 nymphal population

In all of the heavy rain areas of eastern Kansas and Nebraska, most of Missouri, Iowa, Illinois, and Wisconsin nymphal populations were kept down during the whole of the nymphal season because of rains. In many instances the infestations on the breeding grounds, which were mostly field margins, were reduced from 50 to 80 percent of the original population. No movements into the adjoining fields were recorded at such places.

In the entire area mentioned reductions in the grasshopper potential averaged from 25 to 50 percent.

### Effect of egg predators on the infestations

In most of the M. mexicanus area proper egg predators, especially beetle larvae (Bombyliidae) have reduced the number of good eggs 20 to 75 percent, as recorded. The beetle occur in the greatest numbers in western North Dakota in the vicinity of Dickinson. They are not as numerous outside of the four M. mexicanus States as you go southward. Table 6 is a summary by States, of records made of the average number per square foot of each of the three egg predators found during the survey. These records were neither uniformly kept nor regularly recorded, so it was with difficulty that any semblance of a summary table was made. Blister beetle larvae were most important in Wyoming, North Dakota, Colorado, Nebraska, and Iowa, as recorded in the survey notes. Carabid larvae were generally numerous only in Iowa.

In the most severely infested areas of eastern South Dakota in 1938 where populations of active hoppers numbered in the thousands per square yard, the egg reduction by egg predators during the fall and winter of 1937 and 1938 amounted to less than 10 percent. In the Dickinson, N. Dak., area 1 flax field averaged 8 pods per square foot altogether, with 6 of those wholly or partially destroyed by beetle. If it were not for the beetle, the 8 pods per square yard would theoretically produce about 1,500 nymphs per square yard, which would equal some of the populations found in eastern South Dakota in June 1938. With the 75-percent destruction of eggs by beetle, as observed, the population cannot possibly number over 350 per square yard. This, of course, is still a heavy population but not uncommon in local outbreaks where in the past large migration has not been the factor that it was in July 1938. In other words, the enormous numbers of grasshoppers found in the summer of 1938 will not be so general or over so wide an area in 1939. Furthermore, the North Dakota-Montana areas are old established grasshopper areas and egg predators, especially beetle, are also well established. This probably accounts for their abundance in these places. It is also believed that with increased numbers of eggs comes a greater chance of egg predators finding the eggs and this includes skunks, field mice, horned larks, or any other creature that will feed on grasshopper eggs when it comes across them. There must be some degree of chance in the finding of egg pods by all these egg predators, and by increasing the number of eggs not only is the chance of finding them increased but the numbers of those taking part in the egg destruction, other than insect predators, is also increased. Therefore, the end result would be the product of the increased chance times the increased numbers of predators taking part in the egg destruction. For example, in light infestations a skunk or lark may accidentally dig up a pod but, where the infestations are heavy and the pods numerous and congregated, a single animal would feed on a much greater number of eggs and actually look for them. This all adds up to the fact that grasshopper populations do get cut down enormously, often suddenly.



State	Total fields samples			Date on fields where predators were found $\frac{\pm}{\text{ft.}}$					
	Nun- ber	Av. predators Bee Blister flies, beetles	Carabids per sq. ft.	Bee flies	Elister beetles	Carabids	Av. per sq. ft.	Fields	Av. per sq. ft.
<u>M. mexicanus area:</u>									
North Dakota-----	799	1.00	0.30	0.05	685	86	1.10	481	60
Wyoming-----	307	.52	.24	.06	91	30	1.76	159	52
South Dakota-----	924	.39	.26	.03	493	53	.73	362	39
Montana-----	979	.25	.17	.02	340	35	.73	276	28
Total-----	3,009	0.52	0.23	0.03	1,609	53	0.98	1,278	42
<u>M. differentialis</u> <u>area:</u>									
Oklahoma-----	282	0.37	0.29	0.11	87	31	1.21	105	37
Colorado-----	398	.34	.27	.08	234	59	.58	211	53
Kansas-----	708	.13	.13	.03	150	21	.62	149	21
Nebraska-----	542	.10	.29	.08	148	27	.36	267	49
Texas-----	445	.05	.27	.12	18	4	1.19	143	32
Total-----	2,375	0.13	0.24	0.09	637	27	0.49	875	37
<u>North Central-Lake</u> <u>area:</u>									
Minnesota-----	380	0.09	0.06	0.05	103	27	0.33	66	17
Iowa-----	513	.03	.45	.12	81	16	.22	393	77
Total-----	893	0.06	0.28	0.09	184	21	0.28	459	51
Grand Total-----	6,277	0.31	0.24	0.06	2,430	39	0.80	2,612	42
Eliminating fields with none.									

1/ Eliminating fields with none.



ARKANSAS

This is the second year in which collections were made in Arkansas during the adult survey. There were 651 specimens collected in 4 environments in which 9 species were represented. The dominant species is Melanoplus differentialis, with M. femur-rubrum second in numbers. Fifty-one percent of the total specimens collected were nymphs, which probably were either first-generation M. femur-rubrum or second-generation M. mexicanus. In the 1937 collections M. mexicanus was dominant, with M. differentialis second in numbers and M. femur-rubrum third. Hatching began in March and continued throughout May and June. The worst infestations are in the counties along the Mississippi River.

# ARKANSAS

Distribution by species of 651 specimens collected in Arkansas, expressed in percentage of total numbers collected in each habitat.

Species	Alfalfa	Corn	Cotton	Grasses (miscellaneous)	Total specimens	Percentage of total
Chortophaga viridifasciata Deg.	--	--	--	0.81	3	0.46
Dissosteira carolina	--	3.22	--	--	2	.30
Hippiscus rugosus	--	3.22	--	--	2	.30
Melanoplus differentialis	57.75	61.29	47.11	10.84	194	29.80
M. femur-rubrum	2.58	1.61	15.38	12.19	65	9.98
M. mexicanus	5.17	--	1.92	.27	9	1.38
Orphulella speciosa	--	--	--	.27	1	.15
Schistocerca americana	.86	9.67	5.76	2.16	21	3.22
Syrbula admirabilis	1.72	--	.96	7.04	29	4.45
Nymphs	31.89	20.96	28.84	66.39	325	49.92
Total specimens per environment	116	62	104	369	651	--

# ARKANSAS

The percentages of individuals of the various species present in Arkansas, arranged according to crops infested, are summarized as follows:

<u>Alfalfa</u>	<u>Percent</u>	<u>Corn</u>	<u>Percent</u>
1. <i>Melanoplus differentialis</i>	58	1. <i>Melanoplus differentialis</i>	6
2. <i>M. mexicanus</i>	5	2. <i>Schistocerca americana</i>	1
3. <i>M. femur-rubrum</i>	3	3. <i>Hippiscus rugosus</i>	
4. <i>Syrbula admirabilis</i>	2	4. <i>Dissosteira carolina</i>	
5. <i>Schistocerca americana</i>	1	5. Other species and unident.	
6. Other species and unident.	0	6. Nymphs	
7. Nymphs	31		

<u>Cotton</u>		<u>Grasses, miscellaneous</u>	
1. <i>Melanoplus differentialis</i>	47	1. <i>Melanoplus femur-rubrum</i>	3
2. <i>M. femur-rubrum</i>	15	2. <i>M. differentialis</i>	
3. <i>Schistocerca americana</i>	6	3. <i>Syrbula admirabilis</i>	
4. <i>M. mexicanus</i>	2	4. <i>Schistocerca americana</i>	3
5. <i>Syrbula admirabilis</i>	1	5. <i>Chortophaga viridifasciata</i>	1
6. Other species and unident.	0	6. Other species (2) and unident.	1
7. Nymphs	29	7. Nymphs	3

## Summary

	<u>Percent</u>
1. <i>Melanoplus differentialis</i>	30
2. <i>M. femur-rubrum</i>	10
3. <i>Syrbula admirabilis</i>	4
4. <i>Schistocerca americana</i>	3
5. <i>M. mexicanus</i>	1
6. Other species and unident.	1
7. Nymphs	51



COLORADO

This is the fourth year in which collections were made in Colorado during the adult survey. In the 1938 survey 10,278 specimens were collected in 10 different environments. Disregarding Dissosteira longipennis in the southeastern quarter of the State, there were 6 species of major importance. Melanoplus mexicanus was first, at 16 percent of the total number collected; M. differentialis and M. femur-rubrum both at 11 percent; M. bivittatus at 10 percent; M. lakinus at 8 percent; and Aeoloplus turnbullii turnbullii and A. turnbullii bruneri together at 6 percent. On the range land M. mexicanus was the most numerous species other than D. longipennis. It was also dominant in small grain, corn, sorghums, and restoration or idle land. There is no doubt that M. mexicanus has increased in relative numbers in 1938 over some of the other species, although there is no marked change in the relative abundance of the important species.

Hatching of D. longipennis was first observed on April 29, and M. differentialis and M. bivittatus about May 15, continuing until the last week of June. Flights of D. longipennis began the last week of June and continued until about the first of October. The general movement was eastward, and the 1938 surveys indicate that the infestations are again occupying about the same areas as in 1937. The hopper infestations in crops are as heavy or heavier in the irrigated sections in the 1938 fall survey as they were in the 1937 survey. Notwithstanding a conservative estimate of a population reduction of 75 percent for D. longipennis during the 1938 season, the problem still remains about the same. The explanation for this lies in the fecundity of the grasshoppers, which enables them to build up again within one season. About 4,500,000 acres is included in the general areas of the D. longipennis infestations.

Distribution by species of 10,278 specimens collected in Colorado, expressed in percentage of total numbers collected in each habitat

Species	Small grain	Corn sorghum	Alfalfa	Sugar beets	Beans	Weedy places	Range	Bottom grass	Mt. meadow	Field margins	Miscellaneous	Total specimens	% of total
<i>Acrolophus hirtipes</i> Say	0.12	--	--	--	--	--	--	--	--	--	--	2	0.02
<i>Aeoloplus lacinnus</i>	--	--	--	--	0.82	--	--	--	--	--	--	2	0.02
<i>A. turnbullii</i> bruneri Caud.	4.70	6.16	1.15	7.76	1.64	11.83	12.59	0.83	--	4.40	--	599	5.81
<i>A. turnbullii</i> turnbullii Thos.	--	.42	--	--	--	3.80	.99	--	--	--	--	71	.69
<i>Aeropedellus clavatus</i> Thos.	--	--	--	--	--	--	--	--	1.36	--	--	2	.02
<i>Ageneotettix deorum</i> Scudd.	1.45	.14	.15	.17	1.23	.80	1.43	2.64	--	1.20	--	90	.87
<i>Amphitornus coloratus</i> Thos.	--	--	--	--	--	.07	.56	.17	--	1.00	--	16	.16
<i>Arphia pseudonietana</i> Thos.	.17	--	--	--	--	--	.50	.99	--	--	--	17	.16
<i>Aulocara elliotti</i> Thos.	4.87	1.12	.44	--	.82	2.56	4.15	2.97	5.44	--	--	234	2.27
<i>Boopodon nubilum</i> Say	.17	.70	.15	--	--	--	--	7.26	--	--	--	56	.54
<i>Brachystola magna</i> Gir.	.12	--	.07	--	--	.15	.25	--	--	.40	--	12	.12
<i>Cammula pellucida</i> Scudd.	--	--	--	--	--	--	--	--	25.84	--	--	38	.37
<i>Chortippus longicornis</i> Latr.	--	--	--	--	--	--	--	.17	--	--	--	1	.01
<i>Cordillacris crenulata</i> Brun.	1.10	--	--	--	--	--	.56	--	--	--	--	28	.27
<i>C. occipitalis</i> Thos.	.70	--	--	--	--	--	1.74	--	--	--	--	40	.39
<i>Cratypedes neglectus</i> Thos.	.06	--	--	--	--	--	--	--	--	--	--	1	.01
<i>Dactyloctenium pictum</i> Thos.	--	--	--	--	--	--	--	--	--	1.80	--	9	.09
<i>Derotemna haydenii</i> Thos.	1.45	--	.11	.17	--	.95	1.36	.33	1.36	.80	--	72	.70
<i>Dissosteira carolina</i> L.	.17	.42	.11	--	--	.07	.06	--	--	--	--	11	.11
<i>D. longipennis</i> Thos.	1.62	2.80	--	.50	1.23	1.02	3.97	--	6.12	.40	--	143	1.39
<i>Drepanopterna femoratum</i> Scudd.	.46	.14	.04	--	--	.29	.31	2.48	--	--	--	34	.33
<i>Encyrtolophus sordidus</i> costalis Scudd.	.12	--	.44	.17	--	--	--	6.11	--	--	--	52	.50
<i>Hadrotettix trifasciatus</i> Say	.29	.42	.22	.50	--	.51	.56	.66	--	--	--	37	.36
<i>H. speciosus</i> Scudd.	.41	1.82	.30	.33	12.30	3.58	.06	1.49	--	4.80	--	143	1.39
<i>H. viridis</i> Thos.	.23	--	--	--	--	.07	.68	--	--	--	--	16	.16
<i>Hippiscus rugosus</i> Scudd.	--	--	--	--	--	--	--	.50	--	.20	--	4	.04
<i>Hypochlora alba</i> Dodge	--	--	--	--	--	--	.37	.33	--	--	--	8	.08
<i>Melanoplus angustipennis</i> Dodge	1.74	3.36	.78	.83	1.64	2.99	6.01	2.81	--	2.20	--	250	2.43
<i>M. bivittatus</i> Say	12.35	12.88	12.58	18.48	9.43	8.32	.56	7.26	4.76	6.40	27.44	1000	9.70



Species	Small grain	Corn sorghum	Alfalfa	Sugar beets	Beans	Weedy places	Range	Bot- tom	Mt. meadow	Field mar- gins	Mis- cell- aneous	Total spec- imens	% of total
Melanoplus bowditchi Scudd.	1.80	3.92	.85	1.00	.41	.58	3.47	--	--	.60	--	156	1.51
M. confusus Scudd.	--	--	--	--	--	--	.06	--	--	--	--	1	.01
M. dawsoni Scudd.	--	--	--	--	--	--	.06	--	--	--	--	1	.01
M. differentialis Thos.	10.44	17.78	14.43	30.86	20.50	6.35	2.54	2.15	--	5.60	58.80	1133	10.99
M. femur-rubrum Deg.	5.57	2.52	20.50	13.53	6.97	11.32	.43	12.38	.68	16.20	--	1086	10.53
M. foedus foedus Scudd.	5.34	8.96	2.07	.50	--	6.42	9.05	.99	--	1.60	--	463	4.49
M. gladstoni Scudd.	.81	.14	.19	--	.82	.73	.99	.50	--	.20	--	52	.50
M. infantilis Scudd.	.23	--	--	--	--	.15	.56	--	.68	--	--	16	.16
M. lakinus Scudd.	6.67	5.74	10.43	9.90	8.20	10.88	1.18	.99	--	25.20	7.84	822	7.97
M. mexicanus Sauss.	21.00	21.84	14.10	4.46	19.27	19.86	20.89	8.25	6.12	3.80	1.96	1661	16.11
M. occidentalis Thos.	.06	--	--	.33	--	.58	1.24	--	11.56	--	--	48	.47
M. packardii Scudd.	5.28	2.38	1.30	.17	11.89	3.14	2.48	3.47	.68	5.00	--	303	2.94
M. regalis Dodge	.12	--	--	--	--	.15	.06	.17	.68	4.20	--	28	.27
M. s. scudderii Uhl.	--	--	--	--	--	--	--	--	--	.20	--	1	.01
Meymiria maculipennis Rehn	--	--	--	--	--	--	--	2.31	--	2.80	--	28	.27
M. maculipennis macclungi Rehn	.29	.14	.11	--	--	.15	3.19	4.62	--	5.00	--	67	.65
Mestobregma sp.	--	--	--	--	--	--	--	.17	--	--	--	1	.01
Metator pardalinus Sauss.	.29	--	--	--	--	--	.12	--	1.36	--	--	9	.09
Opeia obscura Thos.	.46	--	--	--	--	.22	.12	1.82	--	.60	--	27	.26
Orphulella pelidna Burm.	--	--	--	--	--	.07	--	3.96	--	--	--	25	.24
O. speciosa Scudd.	--	--	--	--	--	--	.18	--	--	--	--	3	.03
Paropomala wyomingensis Thos.	.06	--	--	--	--	--	.06	--	--	1.80	--	11	.11
Philibostroma quadrimaculatum Thos.	2.15	--	--	--	--	--	3.16	3.47	2.04	.40	--	114	1.11
Phoetaliotes nebrascensis Thos.	.17	--	.04	--	--	--	--	10.40	--	1.80	--	76	.74
Psoloessa d. delicatula Scudd.	--	--	--	--	--	--	--	--	1.36	--	--	2	.02
Schistocerca lineata Scudd.	--	.42	--	--	--	--	--	--	--	--	--	3	.03
Spharagemon collare Scudd.	.58	1.68	.63	.17	.41	.22	.74	.50	2.04	.40	--	64	.62
S. equale Say	.17	.28	.04	--	--	--	.37	--	--	--	--	12	.12
Trachyrhachis kiowa kiowa Thos.	.70	--	.04	--	--	.15	2.79	4.46	8.16	--	--	99	.96
Trachyrhachis sp.	--	--	--	--	--	--	.31	--	--	--	--	5	.05



CCOLORADO (Continued)

Species	Small grain	Corn sorghum	Alfalfa	Sugar beets	Beans	Weedy places	Range	Bot- tom grass	Mt. mead- ow	Field mar- gins	Mis- cell- aneous	Total spec- imens	% of total
Trimerotropis agrestis McN.	--	--	--	--	--	--	.12	--	--	--	--	2	.02
T. laticincta Sauss.	.17	--	.04	.17	--	.29	1.74	--	--	.20	--	38	.37
T. pallidipennis Burm.	.46	.14	.48	--	--	.44	--	--	--	--	--	28	.27
T. formosus Say	--	--	--	--	--	--	.12	--	--	--	--	2	.02
Xanthippus corallipes Hald.	--	--	--	--	--	--	--	--	2.04	--	--	3	.03
Undetermined species	.46	.42	.04	1.16	--	.15	.62	.33	3.40	--	--	38	.37
Nymphs	3.48	2.80	19.06	8.75	1.64	1.31	9.61	2.15	13.60	.40	3.92	562	5.36
Total specimens per environment	1,708	711	2726	605	242	1,372	1,613	606	146	498	51	10278	--

COLORADO

The percentages of individuals of the various species present in Colorado, arranged according to crops infested, are summarized as follows:

<u>Small grain</u>		<u>Percent</u>	<u>Alfalfa</u>		<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----		21	1. <i>Melanoplus femur-rubrum</i> -----		20
2. <i>M. bivittatus</i> -----		12	2. <i>M. differentialis</i> -----		14
3. <i>M. differentialis</i> -----		10	3. <i>M. mexicanus</i> -----		14
4. <i>M. lakinus</i> -----		7	4. <i>M. bivittatus</i> -----		13
5. <i>M. femur-rubrum</i> -----		6	5. <i>M. lakinus</i> -----		10
6. 37 other sp. and undet.-----		40	6. 23 other sp. and undet.-----		10
7. Nymphs-----		4	7. Nymphs-----		19
<u>Corn and sorghums</u>			<u>Sugar beets</u>		
1. <i>Melanoplus mexicanus</i> -----		22	1. <i>Melanoplus differentialis</i> -----		31
2. <i>M. differentialis</i> -----		18	2. <i>M. bivittatus</i> -----		18
3. <i>M. bivittatus</i> -----		13	3. <i>M. femur-rubrum</i> -----		13
4. <i>M. foedus foedus</i> -----		9	4. <i>M. lakinus</i> -----		10
5. <i>Aeoloplus turnbullii bruneri</i> ---		6	5. <i>Aeoloplus turnbullii bruneri</i> ---		8
6. 20 other sp. and undet.-----		29	6. 14 other sp. and undet.-----		11
7. Nymphs-----		3	7. Nymphs-----		9
<u>Beans</u>			<u>Range</u>		
1. <i>Melanoplus differentialis</i> -----		21	1. <i>Melanoplus mexicanus</i> -----		21
2. <i>M. mexicanus</i> -----		19	2. <i>Aeoloplus turnbullii bruneri</i> ---		12
3. <i>Hesperotettix speciosus</i> -----		12	3. <i>M. foedus foedus</i> -----		9
4. <i>M. packardii</i> -----		12	4. <i>M. angustipennis</i> -----		6
5. <i>M. bivittatus</i> -----		10	5. <i>Aulocara elliotti</i> -----		4
6. 11 other sp.-----		24	6. 41 other sp. and undet.-----		38
7. Nymphs-----		2	7. Nymphs-----		10
<u>Restoration (weedy)</u>			<u>Bottom grass</u>		
1. <i>Melanoplus mexicanus</i> -----		20	1. <i>Melanoplus femur-rubrum</i> -----		13
2. <i>Aeoloplus turnbullii bruneri</i> ---		12	2. <i>Phoetaliotes nebrascensis</i> -----		11
3. <i>M. femur-rubrum</i> -----		11	3. <i>M. mexicanus</i> -----		8
4. <i>M. lakinus</i> -----		11	4. <i>M. bivittatus</i> -----		7
5. <i>M. bivittatus</i> -----		8	5. <i>Boopedon nubilum</i> -----		7
6. 41 other sp. and undet.-----		37	6. 28 other sp. and undet.-----		52
7. Nymphs-----		1	7. Nymphs-----		2

COLORADO (Cont'd).

<u>Mountain meadow</u>	<u>Percent</u>	<u>Miscellaneous</u>	<u>Percent</u>
1. Cammula pellucida-----	26	1. Melanoplus differentialis-----	5
2. Melanoplus occidentalis-----	12	2. M. bivittatus-----	2
3. Trachyrhachis kiowa kiowa-----	8	3. M. lakinus-----	
4. M. mexicanus-----	6	4. M. mexicanus-----	
5. Dissosteira longipennis-----	6	5. Nymphs-----	
6. 13 other sp. and undet.-----	28		
7. Nymphs-----	14		

<u>Field margin</u>		<u>Grand total</u>	
1. Melanoplus lakinus-----	25	1. Melanoplus mexicanus-----	1
2. M. femur-rubrum-----	16	2. M. differentialis-----	3
3. M. bivittatus-----	6.5	3. M. femur-rubrum-----	3
4. M. differentialis-----	6	4. M. bivittatus-----	2
5. M. packardii-----	5	5. M. lakinus-----	1
6. 24 other sp.-----	41	6. 60 other sp. and undet.-----	6
7. Nymphs-----	0.5	7. Nymphs-----	3



IDAHO

This is the first year that collections were made in Idaho during the adult survey. For the most part, the collections were confined to an area where the natural vegetation was originally sagebrush designated as the northern desert shrub area. The most important sagebrush is Artemisia tridentata, which ranges in height from 2 to 7 feet. Other common plants are little rabbitbrush (Chrysothamnus stenophyllus), matchweed (Gutierrezia sarothrae), and others. One of the most common grasses is an introduced annual brome, Bromus tectorum, commonly called downy brome grass. Crops are mostly in irrigated sections with seed alfalfa, a most important crop. This suffers from invasions from the adjacent rangeland grasshopper infestations, even when such infestations are comparatively light.

Melanoplus femur-rubrum was the dominant species in the 305 specimens collected. A collection of this size for a State is too small upon which to base any conclusions. M. mexicanus formed half of a small collection made in alfalfa. Hatching began the first week of May and subsequent unfavorable weather conditions delayed and prolonged it. Infestations originated to some extent in downy brome grass. Infestations are on the increase and follow the irrigated farm areas.

IDAHO

Distribution by species of 305 specimens collected in Idaho, expressed in percentage of total  
numbers collected in each habitat

Species	Idle land	Alfalfa	Meadow, pasture and hay	Dry swamp	Total specimens	Percentage of total
<i>Cannula pellucida</i> -----	--	21.62	13.29	30.76	54	17.70
<i>Chortippus longicornis</i> -----	--	--	26.21	23.07	49	16.06
<i>Conoza</i> sp.-----	2.43	--	--	--	1	0.32
<i>Dissosteira carolina</i> -----	2.43	--	--	--	1	0.32
<i>D. spurcata</i> -----	2.43	--	--	--	1	0.32
<i>Melanoplus bivittatus</i> -----	--	5.40	--	3.84	5	1.63
<i>M. devastator</i> -----	4.87	--	0.60	--	3	0.98
<i>M. femur-rubrum</i> -----	--	6.75	50.00	38.46	98	32.13
<i>M. foedus</i> -----	7.31	12.16	--	--	12	3.93
<i>M. mexicanus</i> -----	36.58	50.00	4.87	--	60	19.67
<i>Oedaleonotus enigma</i> Scudd.-----	41.46	2.70	--	--	19	6.22
<i>Phoetaliotes nebrascensis</i> -----	2.43	--	--	--	1	0.32
Undetermined-----	--	1.35	--	--	1	0.32
Total specimens per environment-----	41	74	164	26	305	--

IDAHO

The percentages of individuals of the various species present in Idaho, arranged according to crops infested, are summarized as follows:

<u>Idle land</u>		<u>Alfalfa</u>	
	<u>Percent</u>		<u>Percent</u>
1. Oedaleonotus enigma-----	41	1. Melanoplus mexicanus-----	50
2. Melanoplus mexicanus-----	37	2. Camnula pellucida-----	22
3. M. foedus foedus-----	7	3. Melanoplus foedus foedus-----	12
4. M. devastator-----	5	4. M. femur-rubrum-----	7
5. Dissosteira carolina-----	2	5. M. bivittatus-----	5
6. Other species (3) and unident.--	8	6. Other species and undeter.-----	4
7. Nymphs-----	0	7. Nymphs-----	0

<u>Meadow, pasture, and hay</u>		<u>Dry swamp</u>	
1. Melanoplus femur-rubrum-----	50	1. Melanoplus femur-rubrum-----	40
2. Chortippus longicornis-----	26	2. Camnula pellucida-----	32
3. Camnula pellucida-----	18	3. Chortippus longicornis-----	24
4. Melanoplus mexicanus-----	5	4. Melanoplus bivittatus-----	4
5. M. devastator-----	1	5. Other species-----	0
6. Other species-----	0	6. Nymphs-----	0
7. Nymphs-----	0		

Summary

	<u>Percent</u>
1. Melanoplus femur-rubrum----	33
2. M. mexicanus-----	20
3. Camnula pellucida-----	18
4. Chortippus longicornis----	16
5. Oedaleonotus enigma-----	8
6. Other species and unident.-	5
7. Nymphs-----	0



ILLINOIS

This is the first year in which collections were made in this State during the adult survey. The original natural vegetation areas of Illinois were the tall-grass prairies and the oak-hickory southern hardwood forest along the rivers and streams. As in Iowa and other tall-grass prairie States, the original vegetation areas have been changed by the introduction of agriculture and attendant changes in topography and flora. As a rule, grasshoppers do not flourish to the extent they do out West in the Great Plains States. There were 5,539 specimens collected, representing some 24 species in 8 different environments. Melanoplus femur-rubrum was the most important species in all the environments, with the exception of cornfields and waste places. In the latter, M. differentialis was dominant. For the entire State collection, M. femur-rubrum was first in numbers at 21 percent; M. differentialis second at 9 percent; and M. mexicanus third at 6 percent.

A small percentage of hatch had occurred in the southern part of the State by the first of May. Frequent heavy rains retarded hatching and reduced populations so that damage was negligible in almost every county. Some late damage occurred from adults. There are two areas of infestation; one in the northern tier of counties and one in the mid-western part of the State. Normal rainfall conditions will probably hold these in check.

Distribution by species of 5,539 specimens collected in Illinois, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--							Total specimens	Percent age of grand total
	Graded roadside	Legumes	Pasture	Small grain	Waste farm land	Tame hay crops	Corn		
Ageneotettix deorum deorum	0.31	--	0.27	--	2.13	--	--	19	0.34
Arphia sulphurea (F.)	.23	0.24	--	--	--	0.42	--	7	.13
A. xanthoptera (Burm.)	.08	--	--	--	--	--	--	1	.02
Campylocantha olivacea Scudd.	.08	.65	--	1.04	.36	.85	0.89	23	.42
Chloealtis conspersa Harr.	.08	--	--	--	--	--	--	1	.02
Chortippus longicornis	.08	--	--	--	.71	--	--	5	.09
Chortippus viridifasciata	.77	1.29	1.87	1.73	1.42	2.12	.89	76	1.37
Dichromorpha viridis Scudd.	.38	.24	--	.35	.18	--	1.79	15	.27
Dissosteira carolina	.54	.32	.18	.46	--	--	.89	19	.34
Hesperotettix viridis	.15	--	--	.23	.18	--	--	5	.09
Hippiscus rugosus	.77	.65	2.31	.46	.36	--	--	53	.96
Hypochlora alba	.08	--	--	--	--	--	3.16	1	.02
Melanoplus angustipennis	--	.40	.18	.12	1.07	--	--	14	.25
M. bivittatus	--	--	.18	--	--	--	--	3	.05
M. differentialis	9.29	12.76	2.40	5.88	11.90	6.36	37.50	487	8.79
M. femur-rubrum	21.03	23.18	13.24	27.10	9.41	35.17	16.96	1161	20.96
M. mexicanus	2.23	10.42	4.36	11.42	3.37	1.69	2.68	334	6.03
Mermiria maculipennis macclungi	--	--	--	--	.18	--	--	1	.02
Orphulella speciosa	.69	.65	3.20	.23	.18	1.69	--	62	1.12
Schistocerca alutacea Harr.	.15	--	.09	--	1.78	--	--	13	.23
S. americana americana (Drury)	1.00	1.21	.18	1.04	2.13	.42	.89	53	.96
Spharagemon collaris	--	.16	.09	--	.18	--	--	4	.07
Syrbula admirabilis Uhler	1.38	.24	5.24	.35	1.07	--	--	91	1.64
Trachyrhachis kiowa fuscifrons Stal	.69	.32	.36	.35	.18	--	--	21	.38
Nymphs	60.01	47.25	65.86	49.25	63.23	51.27	36.61	3070	55.41
Total specimens per environment	1,303	1,238	1,125	867	563	236	112	95	--

ILLINOIS

The percentages of individuals of the various species present in Illinois, arranged according to crops infested, are summarized as follows:

<u>Graded roadside</u>		<u>Percent</u>	<u>Legumes</u>		<u>Percent</u>
1.	Melanoplus femur-rubrum-----	21	1.	Melanoplus femur-rubrum-----	23
2.	M. differentialis-----	9	2.	M. differentialis-----	13
3.	M. mexicanus-----	2	3.	M. mexicanus-----	10
4.	Syrbula admirabilis-----	1	4.	Chortippus viridifasciata----	1
5.	Schistocerca a. americana----	1	5.	Schistocerca a. americana----	1
6.	15 other species-----	66	6.	10 other species-----	52
		Nymphs - 60			Nymphs - 47

<u>Pasture grassland</u>			<u>Small grain</u>		
1.	Melanoplus femur-rubrum-----	13	1.	Melanoplus femur-rubrum-----	27
2.	Syrbula admirabilis-----	5	2.	M. mexicanus-----	11
3.	M. mexicanus-----	4	3.	M. differentialis-----	6
4.	Orphulella speciosa-----	3	4.	Chortippus viridifasciata----	2
5.	M. differentialis-----	2	5.	Campylocantha o. olivacea----	1
6.	10 other species-----	73	6.	9 other species-----	53
		Nymphs - 66			Nymphs - 49

<u>Waste farmland</u>			<u>Tame-hay crops</u>		
1.	Melanoplus differentialis-----	12	1.	Melanoplus femur-rubrum-----	35
2.	M. femur-rubrum-----	9	2.	M. differentialis-----	6
3.	M. mexicanus-----	3	3.	Chortippus viridifasciata----	2
4.	Schistocerca a. americana-----	2	4.	M. mexicanus-----	2
5.	Ageneotettix d. deorum-----	2	5.	Orphulella speciosa-----	2
6.	13 other species-----	72	6.	3 other species-----	53
		Nymphs - 63			Nymphs - 51

<u>Corn</u>			<u>Wooded pasture</u>		
1.	Melanoplus differentialis-----	38	1.	Melanoplus femur-rubrum-----	64
2.	M. femur-rubrum-----	17	2.	M. differentialis-----	6
3.	M. mexicanus-----	3	3.	Hippiscus rugosus-----	3
4.	Dichromorpha viridis-----	2	4.	M. mexicanus-----	2
5.	Campylocantha o. olivacea-----	1	5.	Orphulella speciosa-----	2
6.	4 other species-----	39	6.	3 other species-----	23
		Nymphs - 37			Nymphs - 18

Percentage of grand total

1.	Melanoplus femur-rubrum-----	21
2.	M. differentialis-----	9
3.	M. mexicanus-----	6
4.	Syrbula admirabilis-----	2
5.	Chortippus viridifasciata-----	1
6.	19 other species-----	61
		Nymphs - 55



IOWA

This is the fourth year in which collections were made in Iowa in the adult survey. Collections have been made in 1935, 1936, 1937, and 1938. In 1936 the specimens were boxed up ready for shipment and allowed to lie around the insectary, and mice destroyed the lot. This is written in as a warning that mice will do this to dried grasshopper specimens, and proper care must be taken to prevent it. It has happened at the Bozeman, Mont., laboratory and means simply a wasted effort on the part of the collector and lost information on the part of the grasshopper survey.

There were 11,853 specimens collected in 8 major environments and 29 species were represented. Undetermined nymphs made up 40 percent of the total collection and most of these were probably Melanoplus femur-rubrum. The dominant species in the collections was M. femur-rubrum, not including nymphs. M. mexicanus and M. differentialis were second in numbers. In the legumes and pastures M. femur-rubrum was most numerous, whereas in corn M. differentialis was by far the most important grasshopper. It must be understood, however, that these collections are made rather late in the season, and some portion of the early maturing species, like M. mexicanus and M. bivittatus, may have finished their life cycle and gone. M. femur-rubrum is a very late-maturing species and adults of these hardly show up before July 15, but would be numerous in collections made in August. There has been some great change in the relative numbers of specimens collected in 1937 and 1938. M. femur-rubrum was not of such great importance in 1938 as in 1937. M. differentialis, on the other hand, has increased its relative percentage of total number specimens collected from 5 percent in 1937 to 13 percent in 1938, and in corn from 31 to 52 percent. It has approximately doubled its relative importance in all environments.

Hatching of M. mexicanus and M. bivittatus began the last week of April, with heavy rains prolonging the hatch all through May and part of June. M. differentialis did not begin hatching until about the first of June. Continued rains held infestations in check and reduced the nymphal populations from 50 to 80 percent of their possible numbers. In fact the grasshopper potential for the entire State was reduced to one-half of what it was in the 1937 survey. There were some second-generation of M. mexicanus but not as many as in 1937. The outlook for next year is about half as serious, with the greatest losses to be expected from M. differentialis.

Distribution by species of 11,853 specimens collected in Iowa, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--					Total specimens	% of grand total		
	Legumes	Roadside	Pasture	Small grain	Idle land				
					River bottom	Corn patches	Woody patches		
Ageneotettix d. deorum----	1.23	1.31	9.36	3.75	1.41	0.60	1.50	343	2.89
Arphia pseudonietana----	--	--	.05	--	--	--	--	1	.01
A. simplex Scudd.----	--	--	--	--	.30	--	--	3	.03
A. sulphurea----	--	.12	.05	.07	--	--	--	5	.04
Aulocara elliotti----	--	--	.05	--	--	--	--	1	.01
Chortippus longicornis----	--	--	.05	--	--	--	--	1	.01
Dichromorpha viridis----	--	.20	.15	.07	--	--	--	10	.08
Dissosteira carolina----	.19	.40	.20	.63	.20	.81	--	36	.30
Encyrtolophus sordidus Burm.----	.03	.04	.15	--	.10	--	--	7	.06
Hesperotettix speciosus----	--	--	.05	--	1.00	--	--	11	.09
H. viridis----	--	.32	--	--	--	--	--	9	.08
Hippiscus rugosus----	.03	--	.60	.14	.40	--	--	19	.16
Melanoplus bivittatus----	2.92	7.33	2.16	5.07	4.72	10.48	19.44	634	5.34
M. differentialis----	11.70	15.17	5.79	10.42	10.04	16.94	52.39	1494	12.59
M. femur-rubrum----	20.93	22.10	31.50	19.25	33.53	13.10	7.04	2724	22.96
M. keeleri luridus Dodge----	.03	--	--	--	1.81	--	--	19	.16
M. mexicanus----	10.73	6.65	8.91	35.58	17.07	7.86	9.01	1570	13.24
M. packardii----	.24	.20	.25	.21	.10	.20	--	24	.20
M. s. scudderi----	--	--	--	--	--	--	--	3	.03
Mermiria maculipennis macclungi----	--	--	.65	--	--	--	--	13	.11
Orphulella speciosa----	.05	.04	5.59	.28	.80	--	--	126	1.06
Pardalophora baldemanni Scudd.----	--	--	.10	--	--	--	--	2	.02
Phaenolotus nebrascensis----	.03	--	.05	.07	--	.20	.28	5	.04
Schistocerca a. americana----	--	.04	--	--	--	--	--	1	.01
S. lineata----	--	--	--	--	--	--	.30	1	.01
Spharagemon collaris----	.03	--	--	--	--	--	--	1	.01
Syrbula admirabilis----	--	.12	.10	--	.20	--	--	7	.06
Trachynachis kiowa fuscifrons----	--	.08	--	--	--	--	--	2	.02
T. kiowa kiowa----	.03	.08	.35	.14	--	--	--	12	.10
Nymphs----	51.83	45.79	33.82	24.32	28.31	49.80	10.42	4769	40.20
Total specimens per environment----	3,735	2,511	1,987	1,439	996	496	355	334	11,853
									--



IOWA

The percentages of individuals of the various species present in Iowa, arranged according to crops infested, are summarized as follows:

Legumes

	<u>Percent</u>
1. Melanoplus femur-rubrum-----	21
2. M. differentialis-----	12
3. M. mexicanus-----	11
4. M. bivittatus-----	3
5. Ageneotettix d. deorum-----	1
6. 9 other species-----	52
Nymphs - 52	

Roadside

	<u>Percent</u>
1. Melanoplus femur-rubrum-----	22
2. M. differentialis-----	15
3. M. bivittatus-----	7
4. M. mexicanus-----	7
5. Ageneotettix deorum-----	1
6. 11 other species-----	48
Nymphs - 46	

Pasture grassland

1. Melanoplus femur-rubrum-----	32
2. Ageneotettix deorum-----	9
3. M. mexicanus-----	9
4. M. differentialis-----	6
5. Orphulella speciosa-----	6
6. 16 other species-----	38
Nymphs - 34	

Small grain

1. Melanoplus mexicanus-----	36
2. M. femur-rubrum-----	19
3. M. differentialis-----	10
4. M. bivittatus-----	5
5. Ageneotettix deorum-----	4
6. 8 other species - 26	

Idle land

1. Melanoplus femur-rubrum-----	34
2. M. mexicanus-----	17
3. M. differentialis-----	10
4. M. bivittatus-----	5
5. M. keeleri luridus-----	2
6. 9 other species-----	32
Nymphs - 28	

River bottom

1. Melanoplus differentialis-----	17
2. M. femur-rubrum-----	13
3. M. bivittatus-----	10
4. M. mexicanus-----	8
5. Dissosteira carolina-----	1
6. 3 other species-----	51
Nymphs - 50	

Corn

1. Melanoplus differentialis-----	52
2. M. bivittatus-----	19
3. M. mexicanus-----	9
4. M. femur-rubrum-----	7
5. Ageneotettix deorum-----	1
6. 4 other species-----	12
Nymphs - 10	

Woody patches

1. Melanoplus mexicanus-----	22
2. M. femur-rubrum-----	18
3. M. bivittatus-----	17
4. M. differentialis-----	12
5. Ageneotettix deorum-----	2
6. 2 other species-----	29
Nymphs - 28	

Percentage of grand total

1. Melanoplus femur-rubrum-----	23
2. M. mexicanus-----	13
3. M. differentialis-----	13
4. M. bivittatus-----	5
5. Ageneotettix deorum-----	3
6. 24 other species-----	43
Nymphs - 40	



KANSAS

This is the second year in which collections were made in the State during the adult survey. There were 10,355 specimens collected in 8 different environments and 52 species are represented. In alfalfa, small grains, and pasture land Melanoplus mexicanus was the most numerous of all species, whereas in corn and sorghums M. differentialis was first in numbers and M. bivittatus second. M. Mexicanus was dominant for the State collection as a whole. Several big changes have taken place between the 1937 and 1938 infestations in regard to the relative abundance of the different species. In 1937 Cordillacris crenulata was first on the range land, at 60 percent of the specimens collected, and ranked third in the total number collected. In the 1938 collection, only 1 specimen was collected in the total of 10,355. A similar change in the relative numbers of this species occurred in Nebraska in 1938 and in Montana between 1935 and 1936. There was also a definite increase in the relative numbers of Aeoloplus turnbullii from 1.5 percent of the total specimens collected in 1937 to 5.9 percent of the total in 1938.

Some reports of hatching came in the first week of April and by the end of the month hatching was general over the State. Rains retarded hatching and greatly reduced populations, especially in the eastern counties. No major flights occurred in the State. The western part still has the heaviest infestations, although most of them do not exceed a class 3, or "threatening," condition.

Distribution by species of 10,335 specimens collected in Kansas, expressed in percentage of total number collected in each habitat

Species	Percentage collected in --						Total specimens	Percentage of grand total
	Small grain	Pasture	Legumes	Sorghums	Corn	Weeds	Road-side	Coulee bottom
<i>Aeoloplus turnbullii</i> bruneri	8.72	4.18	0	6.38	1.60	42.00	11.81	--
<i>Ageneotettix deorum</i>	1.09	10.18	.86	.35	2.40	--	1.05	0.63
<i>Amphitornus coloradus</i>	--	.08	--	--	--	--	--	--
<i>Arphia conspersa</i> Scudd.	--	.04	--	--	--	--	--	--
<i>Arphia simplex</i> Scudd.	--	--	.05	--	--	--	--	--
<i>Aulocara ellioti</i>	1.59	4.90	.09	.28	.34	.67	.42	--
<i>Boopedon maculatum</i> Caud.	--	.17	--	--	--	--	--	--
<i>B. nubilum</i>	.04	2.03	.09	.07	--	--	.42	--
<i>Brachystola magna</i>	--	.04	--	--	--	.67	.21	--
<i>Chortophaga viridifasciata</i>	.04	--	--	--	--	--	--	--
<i>Cordillacris crenulata</i>	--	.04	--	--	--	--	--	--
<i>Derotmema haydeni</i>	.13	--	--	.35	--	1.00	--	--
<i>Dissosteira carolina</i>	.55	.04	.14	.35	--	1.00	.21	--
<i>Dissosteira longipennis</i>	.25	.42	.05	1.06	--	.33	.21	--
<i>Drepanopterna femoratum</i> Scudd.	--	.04	--	--	--	--	--	--
<i>Hadrotettix trifasciatus</i>	.08	.04	.05	.07	.11	.33	--	--
<i>Hesperotettix speciosus</i>	.50	.80	--	.14	1.03	--	4.85	42.90
<i>Hesperotettix viridis</i>	--	.17	--	--	.68	--	.21	.95
<i>Hippiscus rugosus</i>	--	.13	.05	--	.11	--	.21	--
<i>Hypochlora alba</i>	--	.13	--	--	--	--	--	1.58
<i>Melanoplus angustipennis</i>	.55	--	.23	.07	--	--	.21	.63
<i>M. bivittatus</i>	10.40	4.64	15.91	24.04	21.35	2.67	16.03	15.46
<i>M. bowditchi</i>	--	--	.05	--	--	--	--	--
<i>M. differentialis</i>	7.93	3.84	16.23	32.34	38.93	7.00	33.33	21.45
<i>M. femur-rubrum</i>	.34	1.22	.63	.21	1.14	.67	1.27	--
<i>M. flavidus flavidus</i> Scudd.	--	--	--	--	.11	--	--	--
<i>M. foedus fluviatilis</i> Brun.	--	--	.05	.07	--	2.00	--	.32
<i>M. foedus foedus</i> Scudd.	.88	.84	.05	.07	--	--	.21	--
<i>M. foedus iselyi</i> Hebard	--	--	--	--	--	--	.21	--
<i>M. keeleri luridus</i>	--	.04	--	--	--	--	--	--

Kansas (Continued)

Species	Percentage collected in--							Road side	Coulee bottom	Total specimens	Percentage of grand total
	Small grain	Pasture	Legumes	Sorghums	Corn	Weeds					
Melanoplus lakinus	2.81	.80	.63	2.13	.34	4.33		.84	.32	151	1.46
M. mexicanus	40.51	28.96	31.73	17.73	15.30	23.67		7.38	4.42	2856	27.62
M. occidentalis						.33				1	.01
M. packardii	6.08	5.36	3.31	2.55	4.68	7.00		5.06	1.89	473	4.57
M. regalis	.08	2.24	.09	.07				.21		59	.57
Mermiria maculipennis	.34	2.45	.27	.43	.23			.21	.63	83	.80
Mermiria neomexicana (Thos.)		.25						.42		8	.08
Metator pardalinus		.04								1	.01
Opeia obscura		1.39								33	.32
Orphulella pelidna		.08	.05	.07						4	.04
Orphulella speciosa	.13	2.15	.23		.11			.21		61	.59
Pardalophora haldemani		.89	.05		.11					23	.22
Phlibostroma quadrimaculatum		5.32	.05						.32	128	1.24
Phoetaliotes nebrascensis	.17	.38			.11					14	.14
Schistocera a. americana	.13	.04	.05		.11					6	.06
Schistocerca lineata	.08									2	.02
Spharagemon collare	.80		.05	.14						22	.21
Spharagemon equale	.04			.28	.11	.33				7	.07
Syrbula admirabilis		.13	.27		.23					11	.11
Trachyrhachis kiowa fuscifrons		.38			.11					10	.10
Trachyrhachis kiowa kiowa		.17								4	.04
Trimerotropis laticincta	.08	.04			.11					8	.08
Nymphs	15.64	14.86	27.83	10.71	10.62	4.67		14.77	8.52	1694	16.38
Total specimens per environment--	2,384	2,368	2,206	1,410	876	300		474	317	10,335	--



KANSAS

The percentages of individuals of the various species present in Kansas, arranged according to crops infested, are summarized as follows:

<u>Small grain</u>		<u>Percent</u>	<u>Pasture</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	41	1.	Melanoplus mexicanus-----	29
2.	M. bivittatus-----	10	2.	Ageneotettix deorum-----	10
3.	Aeoloplus t. bruneri-----	9	3.	M. packardii-----	5
4.	M. differentialis-----	8	4.	Phlibostroma quadrimaculatum	5
5.	M. packardii-----	6	5.	Aulocara elliotti-----	5
6.	22 other species-----	26	6.	35 other species-----	46
	Nymphs - 16			Nymphs - 15	

Legumes

1.	Melanoplus mexicanus-----	32
2.	M. differentialis-----	16
3.	M. bivittatus-----	16
4.	M. packardii-----	3
5.	Aeoloplus t. bruneri-----	1
6.	23 other species-----	32
	Nymphs - 28	

Sorghums

1.	Melanoplus differentialis---	32
2.	M. bivittatus-----	24
3.	M. mexicanus-----	18
4.	Aeoloplus t. bruneri-----	6
5.	M. packardii-----	3
6.	18 other species-----	17
	Nymphs - 11	

Corn

1.	Melanoplus differentialis-----	39
2.	M. bivittatus-----	21
3.	M. mexicanus-----	15
4.	M. packardii-----	5
5.	Ageneotettix deorum-----	2
6.	18 other species-----	18
	Nymphs - 11	

Weeds

1.	Aeoloplus t. bruneri-----	42
2.	Melanoplus mexicanus-----	24
3.	M. differentialis-----	7
4.	M. packardii-----	7
5.	M. bivittatus-----	3
6.	12 other species-----	17
	Nymphs - 5	

Roadside

1.	Melanoplus differentialis ----	33
2.	M. bivittatus-----	16
3.	Aeoloplus t. bruneri-----	12
4.	M. mexicanus-----	7
5.	M. packardii-----	5
6.	18 other species-----	27
	Nymphs - 15	

Coulee bottom

1.	Hesperotettix speciosus ----	43
2.	Melanoplus differentialis---	21
3.	M. bivittatus-----	16
4.	M. mexicanus-----	4
5.	M. packardii-----	2
6.	9 other species-----	14
	Nymphs - 9	

Percentage of grand total

1.	Melanoplus mexicanus-----	28
2.	M. differentialis-----	16
3.	M. bivittatus-----	13
4.	Aeoloplus t. bruneri-----	6
5.	M. packardii-----	5
6.	47 other species-----	32
	Nymphs - 16	

MICHIGAN

Collections have been made in Michigan during the years 1935 to 1938, inclusive. This past season 4,608 specimens were collected in 5 environments. There were 18 species represented in these collections, with immature forms making up only 3.43 percent. In all 5 environments, M. mexicanus was by far the most numerous and formed 68 percent of the total number of specimens collected. Cannula pellucida is second in relative abundance, and Ageneotettix deorum third. There is about the same relative difference in numbers between M. mexicanus and C. pellucida in 1938 as there was in 1937, but Ageneotettix deorum has definitely increased its relative abundance. It supplanted M. femur-rubrum for third place.

Hatching of M. mexicanus began the latter part of April and dragged out through May and June. Heavy rains reduced nymphal populations, delayed and prolonged hatching, and interfered with the baiting. Most of the baiting was done in July when the hoppers were most active. The grasshopper potential in the 1938 survey was found to be about 85 percent of what it was in the 1937 survey. Although M. mexicanus was by far the most numerous and important grasshopper, yet it does not develop the migratorial tendencies in Michigan that it does in the Great Plains States. Infestations in Michigan are of local character and importance, perhaps because of the natural vegetation and agricultural practices found in Michigan. Numerous small pastures, with plenty of vegetation, and small farms interspersed among heavily wooded areas do not encourage much moving about, as do the broad, wide, open, sparsely vegetated lands of the Great Plains.

Distribution by species of 4,608 specimens collected in Michigan, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--				Total specimens	Percent- age of grand total
	Pasture	Legumes	Small grain	Truck crops	Roadside	
<i>Ageneotettix d. deorum</i> ----	7.47	5.13	14.41	4.24	--	6.97
<i>Arphia pseudonietana</i> ----	1.89	.24	.85	--	0.88	1.50
<i>Cannula pellucida</i> ----	16.39	12.35	4.24	10.17	45.13	15.91
<i>Chloealtis conspersa</i> ----	.03	--	--	--	--	.02
<i>Chortippus longicornis</i> ----	.23	.24	--	--	--	.22
<i>Dissosteira carolina</i> ----	.03	.12	.85	.85	--	.09
<i>Encoptolophus sordidus</i> ----	.17	--	--	--	--	.13
<i>Hesperotettix viridis</i> ----	.03	--	--	--	--	.02
<i>Melanoplus angustipennis</i> ----	.46	--	.85	--	--	.37
<i>M. bivittatus</i> ----	.15	.24	.85	--	--	.17
<i>M. confusus</i> ----	.06	.12	--	--	--	.07
<i>M. dawsoni</i> ----	.09	.12	--	--	--	.09
<i>M. femur-rubrum</i> ----	.41	1.34	1.69	--	.88	.61
<i>M. f. flavidus</i> ----	.15	.24	.85	--	--	.17
<i>M. mexicanus</i> ----	66.34	72.37	73.73	79.66	52.21	67.60
<i>Orphulella speciosa</i> ----	1.31	.12	--	--	--	1.00
<i>Scirtetica m. marmorata</i> Harr.----	.06	--	--	--	--	.04
<i>Spharagemon collare</i> ----	1.51	2.08	--	4.24	--	1.61
<i>Nymphs</i> ----	3.23	5.26	1.69	.85	.88	3.43
Total specimens per environment----	3,441	818	118	118	113	--



MICHIGAN

The percentages of individuals of the various species present in Michigan, arranged according to crops infested, are summarized as follows:

<u>Pasture</u>		<u>Legumes</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	66	1. <i>Melanoplus mexicanus</i> -----	72
2. <i>Camnula pellucida</i> -----	16	2. <i>Camnula pellucida</i> -----	12
3. <i>Ageneotettix d. deorum</i> -----	7	3. <i>Ageneotettix d. deorum</i> -----	5
4. <i>Arphia pseudonietana</i> -----	2	4. <i>Spharagemon collare</i> -----	2
5. <i>Spharagemon collare</i> -----	2	5. <i>M. femur-rubrum</i> -----	1
6. 13 other species-----	7	6. 8 other species-----	8
Nymphs - 3		Nymphs - 5	

<u>Small grain</u>		<u>Truck crops</u>	
1. <i>Melanoplus mexicanus</i> -----	74	1. <i>Melanoplus mexicanus</i> -----	80
2. <i>Ageneotettix d. deorum</i> -----	14	2. <i>Camnula pellucida</i> -----	10
3. <i>Camnula pellucida</i> -----	4	3. <i>Ageneotettix d. deorum</i> -----	4
4. <i>M. femur-rubrum</i> -----	2	4. <i>Spharagemon collare</i> -----	4
5. <i>Arphia pseudonietana</i> -----	1	5. <i>Dissosteira carolina</i> -----	1
6. 4 other species-----	5	6. Nymphs-----	1
Nymphs - 2			

<u>Roadside</u>		<u>Percentage of grand total</u>	
1. <i>Melanoplus mexicanus</i> -----	52	1. <i>Melanoplus mexicanus</i> -----	68
2. <i>Camnula pellucida</i> -----	45	2. <i>Camnula pellucida</i> -----	16
3. <i>Arphia pseudonietana</i> -----	1	3. <i>Ageneotettix deorum</i> -----	7
4. <i>M. femur-rubrum</i> -----	1	4. <i>Spharagemon collare</i> -----	2
5. Nymphs-----	1	5. <i>Arphia pseudonietana</i> -----	2
		6. 13 other species-----	5

MINNESOTA

This is the fourth year that collections have been made in Minnesota. They were made in 1935, 1936, 1937, and 1938. During the past season, 14,402 specimens were taken in 8 major environments. Of these 25.3 percent were immature forms of undetermined species. In the collections the dominant species was M. femur-rubrum in all of the habitats except flax, where M. mexicanus was most numerous. M. mexicanus is second in numbers and Ageneotettix deorum is third. This, however, does not speak the truth for the situation for the western part of the State and the Red River Valley, into which enormous numbers of M. mexicanus migrated in July and August. Cannula pellucida and M. bivittatus were the two most important species in the State from 1932 to 1936, inclusive. Beginning about 1935, M. femur-rubrum has steadily increased in relative numbers and importance. M. mexicanus began in 1936 to increase its importance. Another outstanding fact was the increase in M. differentialis in the southwestern counties. No specimens of this species are recorded in the 1935, 1936, and 1937 collections. In 1938, there were 239 specimens taken, which is 1.66 percent of the total of 14,402 specimens of all species collected in the State. It ranks third in corn and potatoes reaching its greatest relative importance in corn at 11 percent and is sixth in the total numbers collected.

Hatching began the second week in May and continued rains delayed and prolonged it throughout May and June. Nymphs of M. femur-rubrum were still numerous in September. Heavy baiting was done throughout July and August against the migrating swarms of M. mexicanus into the Red River Valley areas. Owing to these migrations, the grasshopper potential as found in the 1938 survey is over one and one-half times that of 1937.

MINNESOTA

Distribution by species of 14,402 specimens collected in Minnesota, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--						Total specimens	Percent- age of grand total
	Legumes	Small grain	Pasture	Idle low land	Roadside	Flax	Corn	Potatoes
Aeropedellus clavatus	--	--	0.04	--	--	--	--	--
Ageneotettix deorum	0.32	1.29	6.33	7.63	5.42	--	--	--
Arphia pseudonietana	.04	.11	1.48	.22	--	--	--	--
Arphia sulphurea	.02	--	--	--	--	0.35	--	--
Camula pellucida	1.01	.32	5.55	--	--	--	--	--
Chloeaaltis conspersa	--	--	.02	--	--	--	--	--
Chortippus longicornis	.36	--	3.21	.95	--	--	--	--
Dissosteira carolina	.11	.65	.05	--	.49	--	--	--
Encoptolophus sordidus	.50	--	.20	--	--	--	0.63	--
Hesperotettix viridis	--	--	.07	.73	--	--	--	--
Melanoplus angustipennis	--	1.08	.96	3.01	--	.35	--	0.66
M. bivittatus	1.84	1.08	.62	1.39	7.88	7.99	10.06	2.30
M. dawsoni	2.27	.11	3.66	--	--	3.82	1.89	.33
M. differentialis	1.21	.97	1.18	3.52	1.97	3.47	10.69	5.92
M. femur-rubrum	53.92	73.09	35.32	46.90	19.21	26.04	34.59	60.85
M. flavidus flavidus	--	.65	1.11	1.47	--	--	--	--
M. gladstoni	.11	.11	.84	.44	--	--	.63	--
M. infantilis	.02	--	1.93	--	--	--	--	--
M. keeleri luridus	.32	.32	.53	--	--	--	--	--
M. mexicanus	7.33	11.86	6.67	1.76	14.29	46.52	13.84	27.63
M. packardii	--	.32	--	--	--	--	.63	.66
Opeia obscura	--	--	.02	--	--	--	--	--
Orphulella pelidna	.02	--	.36	.15	--	--	--	--
Orphulella speciosa	.09	.11	1.39	.37	--	--	--	--
Phoetaliotes nebrascensis	.16	.75	1.14	1.10	--	--	2.52	--
Pseudopomala brachyptera Scudd.	--	--	.02	--	--	--	--	--
Psinidia fenestralis Serv.	--	--	.02	.37	--	--	--	--
Schistocerca sp.	.04	.32	.14	.66	--	--	4.40	--
Spharagemon collaris	.36	.86	1.09	1.39	.49	--	1.26	--
S. equale	--	--	.02	--	--	--	--	--
Trachyrhachis kiowa	.31	.11	.87	.95	.99	--	--	--
Nymphs	29.63	5.82	25.16	26.94	49.26	11.46	18.87	1.64
Total specimens per environment	5,552	927	5,607	1,362	203	288	159	304
								25.30
								3645
								14,402
								--



MINNESOTA

The percentages of individuals of the various species present in Minnesota, arranged according to crops infested, are summarized as follows:

<u>Legumes</u>		<u>Small grain</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----	54	1. <i>Melanoplus femur-rubrum</i> -----	73
2. <i>M. mexicanus</i> -----	7	2. <i>M. mexicanus</i> -----	12
3. <i>M. dawsoni</i> -----	2	3. <i>Ageneotettix deorum</i> -----	1
4. <i>M. bivittatus</i> -----	2	4. <i>M. angustipennis</i> -----	1
5. <i>M. differentialis</i> -----	1	5. <i>M. bivittatus</i> -----	1
6. 16 other species-----	34	6. 14 other species-----	12
Nymphs - 50		Nymphs - 6	
<u>Pasture</u>		<u>Idle low land</u>	
1. <i>Melanoplus femur-rubrum</i> -----	35	1. <i>Melanoplus femur-rubrum</i> -----	47
2. <i>M. mexicanus</i> -----	7	2. <i>Ageneotettix deorum</i> -----	8
3. <i>Ageneotettix deorum</i> -----	6	3. <i>M. differentialis</i> -----	4
4. <i>Cannula pollucida</i> -----	6	4. <i>M. angustipennis</i> -----	3
5. <i>M. dawsoni</i> -----	4	5. <i>M. mexicanus</i> -----	2
6. 24 other species-----	42	6. 13 other species-----	36
Nymphs - 25		Nymphs - 27	
<u>Roadside</u>		<u>Flax</u>	
1. <i>Melanoplus femur-rubrum</i> -----	19	1. <i>Melanoplus mexicanus</i> -----	47
2. <i>M. mexicanus</i> -----	14	2. <i>M. femur-rubrum</i> -----	26
3. <i>M. bivittatus</i> -----	8	3. <i>M. bivittatus</i> -----	8
4. <i>Ageneotettix deorum</i> -----	5	4. <i>M. dawsoni</i> -----	4
5. <i>M. differentialis</i> -----	2	5. <i>M. differentialis</i> -----	3
6. 3 other species-----	52	6. 2 other species-----	12
Nymphs - 49		Nymphs - 11	
<u>Corn</u>		<u>Potatoes</u>	
1. <i>Melanoplus femur-rubrum</i> -----	35	1. <i>Melanoplus femur-rubrum</i> -----	61
2. <i>M. mexicanus</i> -----	14	2. <i>M. mexicanus</i> -----	28
3. <i>M. differentialis</i> -----	11	3. <i>M. differentialis</i> -----	6
4. <i>M. bivittatus</i> -----	10	4. <i>M. bivittatus</i> -----	2
5. <i>Schistocerca</i> sp-----	4	5. <i>M. angustipennis</i> -----	1
6. 6 other species-----	26	6. 2 other species-----	2
Nymphs - 19		Nymphs - 2	

Percentage of grand total

1. <i>Melanoplus femur-rubrum</i> -----	46
2. <i>M. mexicanus</i> -----	8
3. <i>Ageneotettix deorum</i> -----	3
4. <i>Cannula pollucida</i> -----	3
5. <i>M. dawsoni</i> -----	2
6. 26 other species-----	38
Nymphs - 25	

## MISSOURI

This is the first year in which Missouri has been included in the project for making collections in typical environments during the adult survey; and, since this is a first time for this State, something should be said regarding its natural vegetation areas. The State is divided into two major natural vegetation areas. The northern half and western portions are tall-grass prairie or bluestem sod (Andropogon), whereas in the southern half and eastern areas and along streams are the southern hardwoods, "oak and hickory" and "oak and pine." About 38 percent of the land area is in cultivated crops. The crop land is intensively cultivated, with most of the grasshopper breeding grounds limited to field margins, alfalfa fields, and small pastures.

There were 8,198 specimens collected in 7 major environments. Of this number, the two dominant species were Melanoplus differentialis and M. mexicanus, forming 20 and 21 percent, respectively, of the total number. M. differentialis by far was the most important species in corn, soybeans, and weedy places. M. mexicanus was dominant in pastures, tame-hay meadows, alfalfa, and small grain. Of the total collection 36 percent were nymphs of undetermined species. There were 28 species collected and determined.

Deposition of eggs was heavy in the two dominant species in the fall of 1937 but no dense nymphal populations resulted in 1938. Heavy rains, prolonged hatching, increased fungous disease, and other causes held them down. Nymphs of M. femur-rubrum were numerous in July, especially in the eastern portions. This accounts in part for the high percentage of nymphs in the collections. By the first week in May about 50 percent of the M. mexicanus and M. bivittatus had hatched, whereas M. differentialis did not begin hatching until about the middle of May. Oviposition for the two former species began about the middle of July, whereas M. differentialis began a month or so later. The grasshopper potential is down from one-third to one-half of the potential in the 1937 fall survey.

MISSOURI

Distribution by species of 8,198 specimens collected in Missouri, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--					Total specimens	Percent age of grand total
	Pasture	Tame-hay meadow	Legumes	Small grain	Corn		
Ageneotettix deorum-----	4.71	1.87	0.86	1.47	0.13	--	187
Arphia simplex-----	.04	--	--	.09	--	--	2
Arphia sulphurea-----	.04	--	--	--	--	--	1
Arphia xanthoptera-----	.04	.06	--	.09	--	--	3
Chortophaga viridifasciata-----	1.48	1.68	2.76	4.06	.13	.75	157
Dichromorpha viridis-----	.07	--	.07	--	.13	--	4
Dissosteira carolina-----	.07	.06	.20	.09	.13	--	11
Encyrtolophus sordidus-----	.19	.13	--	--	--	.75	8
Hadrotettix trifasciatus-----	.15	.06	.07	--	.13	--	8
Hesperotettix speciosus-----	.07	--	--	.09	--	--	3
Hesperotettix viridis-----	--	--	.07	--	--	--	1
Hippiscus rugosus-----	2.04	.71	.72	.69	.13	1.50	88
Melanoplus bivittatus-----	3.60	5.36	7.10	5.79	6.42	2.26	428
M. confusus-----	--	--	.07	--	--	--	1
M. differentialis-----	12.13	7.42	15.98	11.14	72.48	53.38	1674
M. femur-rubrum-----	5.68	5.36	4.01	1.12	1.18	1.50	325
M. mexicanus-----	13.50	26.47	21.71	44.12	2.23	13.53	1702
M. packardii-----	.04	--	.13	.17	.13	--	6
M. s. scudderi-----	--	--	.20	--	--	--	3
Orphulella sp.-----	10.61	4.32	3.16	.78	--	3.01	414
O. pelidna-----	2.93	--	--	--	--	--	79
Pardalophora haldemani-----	.11	.13	--	.09	--	--	6
P. phoenicoptera Burm.-----	--	--	--	.09	--	--	1
Schistocerca alutacea-----	--	--	.07	--	--	.75	2
S. a. americana-----	.19	--	.72	.26	.26	1.58	29
S. lineata-----	--	.06	.07	--	--	--	2
Syrbula admirabilis-----	.48	.26	.39	.35	.13	.75	29
Trachyrhachis kiowa fuscifrons-----	1.74	1.16	.20	.17	--	--	70
Undetermined-----	--	--	.07	.09	.26	--	5
Nymphs-----	40.07	44.86	41.38	29.27	16.12	20.30	2049
Total specimens per environment	2,695	1,549	1,520	1,158	763	133	8,198



MISSOURI

The percentages of individuals of the various species present in Missouri, arranged according to crops infested, are summarized as follows:

<u>Pasture</u>		<u>Percent</u>	<u>Tame hay meadow</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	14	1.	Melanoplus mexicanus-----	26
2.	M. differentialis-----	12	2.	M. differentialis-----	7
3.	Orphulella sp. -----	11	3.	M. bivittatus-----	5
4.	M. femur-rubrum-----	6	4.	M. femur-rubrum-----	5
5.	Ageneotettix deorum-----	5	5.	Orphulella sp.-----	4
6.	17 other species-----	52	6.	11 other species-----	53
	Nymphs - 40			Nymphs - 45	
<u>Legumes</u>			<u>Small grain</u>		
1.	Melanoplus mexicanus-----	22	1.	Melanoplus mexicanus-----	44
2.	M. differentialis-----	16	2.	M. differentialis-----	11
3.	M. bivittatus-----	7	3.	M. bivittatus-----	6
4.	M. femur-rubrum-----	4	4.	Chortophaga viridifasciata---	4
5.	Orphulella sp. -----	3	5.	Ageneotettix deorum-----	1
6.	16 other species-----	48	6.	14 other species-----	34
	Nymphs - 41			Nymphs - 29	
<u>Corn</u>			<u>Soybeans</u>		
1.	Melanoplus differentialis-----	72	1.	Melanoplus differentialis-----	62
2.	M. bivittatus-----	6	2.	M. mexicanus-----	14
3.	M. mexicanus-----	2	3.	M. bivittatus-----	6
4.	M. femur-rubrum-----	1	4.	Schistocerca a. americana-----	2
5.	10 other species-----	19	5.	M. femur-rubrum-----	1
	Nymphs - 16		6.	3 other species-----	15
				Nymphs - 15	
<u>Weeds</u>			<u>Percentage of grand total</u>		
1.	Melanoplus differentialis-----	53	1.	Melanoplus mexicanus-----	21
2.	M. mexicanus-----	14	2.	M. differentialis-----	20
3.	Orphulella sp. -----	3	3.	M. bivittatus-----	5
4.	M. bivittatus-----	2	4.	Orphulella sp.-----	5
5.	M. femur-rubrum-----	2	5.	M. femur-rubrum-----	4
6.	6 other species-----	26	6.	23 other species-----	45
	Nymphs - 20			Nymphs - 36	

MONTANA

This is the fifth year in which collections were made in typical environments in Montana during the adult survey. There were 11,129 specimens, representing 45 different species, collected in 9 environments. Because of the great flights in July 1938, of Melanoplus mexicanus into eastern Montana, this species was by far the most numerous of all. The year 1938 can be considered as the year of its greatest majority in all environments during the 5 years of collections. It formed 63 percent of the total specimens taken in the State, 46 percent in alfalfa, 83 percent in idle land, 66 percent in reverted land, 85 percent in sugar beets, 82 percent in small grain, 54 percent in range land, and 94 percent in corn, where it is not often a pest. M. femur-rubrum, M. bivittatus, and M. packardii were the other important species. Camnula pellucida and Aulocara elliotti were of still lesser importance. The most interesting species has been M. mexicanus, because of its spectacular flights and the interest shown in its infestations in range and idle land. In the recent history the open range land has not harbored serious outbreaks of this species. The drought of 1934 drove M. mexicanus to the open range and it was the dominant species that year in the collections from these places. In the extreme eastern part of the State, it made up 45 percent of the grasshoppers found in the range. This seemed to have had little effect on the grasshopper fauna the following year, 1935, for M. mexicanus occupied fifth place in the range-land collections, forming 9 percent of such collections. In both the 1936 and 1937 collections it was third in number at 10 percent. Owing to the flights in 1938, it was in first place again, at 54 percent of the total specimens collected on the range land. In 1934 M. bivittatus was greatly reduced by the drought throughout the State. It has increased in numbers proportionately, until in 1938 it held third place, along with M. packardii. On the range land, M. infantilis seems to have equaled or outnumbered Aulocara elliotti and Ageneotettix deorum which were the dominant species in 1937.

Hatching of M. mexicanus began the first week of May and, because of rainy weather, was retarded and prolonged throughout June. The fall survey of 1937 indicated a general reduction in the grasshopper potential in the eastern half of the State. The nymphal surveys showed light populations of nymphs of from 0 to 5 per square yard in many open fields, with heavier populations of from 20 to 150 concentrated along field margins and even 1,000 per square yard in 1 place. These figures did not begin to approach the enormous numbers occurring in north-central South Dakota and parts of North Dakota. Beginning on July 1 and continuing throughout the period of the major flights into eastern Montana from North and South Dakota, population counts ran from 20 to 200 per square yard in many places. Heavy egg deposition occurred where these flights terminated. As in eastern Wyoming, a steadily decreasing grasshopper potential from 1934 has been changed in 1 season to an infestation of major importance.



Distribution by species of 11,129 specimens collected in Montana, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--								Total speci- mens	Percent- age of grand total
	Legumes	Small grain	Idle land	Plains grassland	Re- version	Low Mtn. grassland	Weedy roadside	Corn beets		
Aeoloplus turnbullii	0.28	2.66	1.60	0.58	3.25	1.10	1.44	0.34	138	1.24
Aerochoreutes c. carlinianus Thos.	--	.04	--	.06	--	--	--	--	2	.02
Aeropedellus clavatus	--	--	.06	.19	--	--	--	--	4	.04
Agencotettix deorum	.26	.34	.44	6.27	1.63	--	3.09	--	146	1.31
Amphitormus coloradus	.13	.04	.17	1.55	.41	--	.21	--	36	.32
Arphia pseudonietana	--	.04	.06	.26	--	--	--	--	6	.05
Aulocara elliotti	.78	1.14	2.49	6.34	2.64	--	2.68	--	226	2.03
Boopedon nubilum	--	--	--	--	.20	--	--	--	1	.01
Bruneria brunnea Thos.	--	--	.06	.06	--	--	--	--	2	.02
Camula pellucida	3.18	1.10	.33	1.55	2.03	15.47	1.65	.34	226	2.03
Chortippus longicornis	.50	.25	--	--	--	2.21	--	--	29	.26
Cordillacris crenulata	--	--	--	.32	--	--	--	--	5	.04
C. occipitalis occipitalis	--	--	--	.06	--	--	--	--	1	.01
Cratypedes neglectus Thos.	--	.17	--	--	--	--	--	--	4	.04
Derotmema haydeni	--	.38	.61	.71	--	--	.62	--	36	.32
Dissosteira carolina	.05	.17	.72	--	--	.55	1.86	2.75	46	.41
Drepanopterna femoratum	.03	--	--	.91	--	--	.21	--	16	.14
Encoptolophus sordidus costalis	.05	--	.33	.19	.20	--	--	--	12	.11
E. s. sordidus	--	--	--	.06	--	--	--	--	1	.01
Hadrotettix trifasciatus	.03	.21	.22	.39	.20	--	.21	--	18	.16
Hesperotettix viridis	--	--	.06	.26	.20	.55	.41	--	9	.08
Melanoplus angustipennis	.23	.42	.66	--	--	--	--	.34	32	.29
M. bivittatus	10.45	1.48	1.33	.78	3.66	5.52	7.83	1.03	561	5.04
M. bowditchi canus Hebard	--	--	--	.13	--	--	--	--	2	.02
M. confusus	.03	--	--	--	--	--	--	--	1	.01
M. dawsoni	.18	--	--	.97	--	1.66	.41	--	27	.24
M. differentialis	.78	--	.06	--	--	--	--	--	31	.28
M. femur-rubrum	14.96	1.27	1.49	1.42	3.25	14.92	5.15	2.44	724	6.50
M. foedus foedus	--	--	--	--	.61	--	1.65	--	11	.10
M. gladstoni	.42	--	.50	.84	1.22	--	--	--	44	.40
M. infantilis	.10	.25	.33	6.79	--	--	--	--	121	1.09



Montana (Continued)

Species	Percentage collected in--										Total age of grand total
	Legumes	Small grain	Idle land	Plains grassland	Reversion	Low rtn. grassland	Weedy roadside	Corn	Sugar beets	Total specimens	
Melanoplus mexicanus	45.47	82.11	83.02	54.01	66.26	12.71	62.27	93.81	84.55	7053	63.34
M. occidentalis	.08	.04	.17	.58	--	--	.21	--	--	17	.15
M. packardii	5.97	3.55	3.10	4.59	4.47	8.29	6.80	1.37	--	514	4.62
Mermeria maculipennis macclungi	.03	--	--	--	--	--	--	--	--	1	.01
Metator pardalinus	.08	.08	.11	2.13	.41	--	--	--	--	42	.38
Opeia obscura	.08	.04	--	--	.61	--	--	--	--	7	.06
Orphulella pelidna	--	--	.06	--	--	--	--	--	--	1	.01
Philibostroma quadrimaculatum	--	--	.06	2.20	.20	--	--	--	--	36	.32
Phoetaliotes nebrascensis	.03	--	.06	.32	--	--	.21	--	--	8	.07
Spharagemon collare	.03	.25	.44	.06	--	--	.62	--	--	19	.17
S. equale	.05	.21	.55	.39	.81	--	.41	--	--	29	.26
Trachyrhachis k. kiowa	.23	.13	.17	1.29	1.02	--	--	--	--	40	.36
Trimerotropis laticincta	.05	.13	.33	.13	--	--	.62	--	--	16	.14
T. palidipennis	.03	--	.06	.26	--	--	--	--	--	6	.05
Nymphs	15.02	3.46	.39	3.30	6.50	37.02	1.44	--	--	822	7.38
Total specimens per environment	3,835	2,367	1,809	1,546	492	181	485	291	123	11,129	--

MONTANA

The percentages of individuals of the various species present in Montana, arranged according to crops infested, are summarized as follows:

<u>Legumes</u>		<u>Percent</u>	<u>Small grain</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	46	1.	Melanoplus mexicanus -----	82
2.	M. femur-rubrum-----	15	2.	M. packardii-----	4
3.	M. bivittatus-----	11	3.	Aeoloplus t. turnbullii-----	3
4.	M. packardii-----	6	4.	M. bivittatus-----	1
5.	Cannula pellucida-----	3	5.	M. femur-rubrum-----	1
6.	26 other species-----	19	6.	20 other species-----	9
	Nymphs - 15			Nymphs - 3	

<u>Idle land</u>			<u>Flains grassland</u>		
1.	Melanoplus mexicanus-----	83	1.	Melanoplus mexicanus-----	54
2.	M. packardii-----	3	2.	M. infantilis-----	7
3.	Aulocara elliotti-----	3	3.	Aulocara elliotti-----	6
4.	Aeoloplus t. turnbullii-----	2	4.	Ageneotettix deorum-----	6
5.	M. femur-rubrum-----	1	5.	M. packardii-----	5
6.	26 other species-----	8	6.	29 other species-----	22
	Nymphs - 0			Nymphs - 3	

<u>Reversion</u>			<u>Low-mountain grassland</u>		
1.	Melanoplus mexicanus-----	66	1.	Cannula pellucida-----	15
2.	M. packardii-----	4	2.	M. femur-rubrum-----	15
3.	M. bivittatus-----	4	3.	M. mexicanus-----	13
4.	M. femur-rubrum-----	3	4.	M. packardii-----	8
5.	Aeoloplus t. turnbullii-----	3	5.	M. bivittatus-----	6
6.	16 other species-----	20	6.	5 other species-----	43
	Nymphs - 7			Nymphs - 37	

<u>Woody roadside</u>			<u>Corn</u>		
1.	Melanoplus mexicanus-----	62	1.	Melanoplus mexicanus-----	94
2.	M. bivittatus-----	8	2.	Dissosteira carolina-----	3
3.	M. packardii-----	7	3.	Melanoplus packardii-----	1
4.	M. femur-rubrum-----	5	4.	M. bivittatus-----	1
5.	Ageneotettix deorum-----	3	5.	3 other species-----	1
6.	16 other species-----	15		Nymphs - 0	
	Nymphs - 1				

<u>Sugar beets</u>			<u>Percentage of grand total</u>		
1.	Melanoplus mexicanus-----	85	1.	Melanoplus mexicanus-----	63
2.	M. bivittatus-----	12	2.	M. femur-rubrum-----	7
3.	M. femur-rubrum-----	2	3.	M. bivittatus-----	5
4.	Cannula pellucida-----	1	4.	M. packardii-----	5
	Nymphs - 0		5.	Cannula pellucida-----	2
			6.	40 other species-----	18
				Nymphs - 7.	

NEBRASKA

This is the third adult collection made in Nebraska during the regular adult survey. The other two were made in 1935 and 1937, respectively. No collection was made in 1936. There were 12,965 specimens collected in 6 environments and miscellaneous crops not treated separately, with about 50 species represented. Immature forms comprised about 16 percent of the total specimens collected. Melanoplus mexicanus was easily the dominant grasshopper in all environments, with M. differentialis and M. bivittatus, of equal numbers, second in importance. This held true in alfalfa, small grain, and idle land. In corn M. differentialis was about equal with M. mexicanus in numbers collected. M. bivittatus was third in corn. In 1937 the genus Cordillacris was the most numerous on range and idle land, ranking second to M. mexicanus in the number collected. It formed 6 percent of the total number of specimens collected, while M. mexicanus formed 12 percent. In the 1938 collections Cordillacris formed only half of 1 percent of the total specimens collected and did not come in the first 5 important species classification in any of the environments. A similar sharp reduction of this genus took place in Montana between 1935 and 1936. In 1935 C. crenulata was the most abundant species on the range, forming 15 percent of all specimens collected in this environment. In 1936 it dropped to eighth place forming only 3 percent of those collected. There was definite increase in the relative numbers of M. bivittatus and M. differentialis over the 1937 collections. This increase is as follows: In 1937 M. bivittatus formed 4.16 percent of the total specimens collected and in 1938, 10.57 percent; M. differentialis formed 4.32 percent in 1937 and 11.32 percent in 1938. Egg surveys show these two species on the increase. M. mexicanus also increased from 12.15 percent in 1937 to 51.59 percent in 1938.

Hatching began the latter part of April for M. mexicanus and small local flights of this species began after June 15 and continued through July. There were no major flights like those in the Dakotas, because there was not the pressure of enormous populations. Some second generation of this species hatched out around the first of August, but not nearly so many as in 1937. This was evidenced by a lessened need for control to protect fall grain. Small local flights of M. bivittatus also occurred in July. There were sharp reductions in nymphal populations in parts of eastern Nebraska, because of continuous rains. Predicted infestations did not materialize. On the basis of estimated bait needs, the problem for 1939 will be about the same as it was in 1938.



Distribution by species of 12,965 specimens collected in Nebraska, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--						Total specimens	Percentage of grand total
	Alfalfa	Plains grass land	Foodcrops	Small grain	Corn	Idle land	Misc. crops	
Aeoloplus turnbullii bruneri	3.32	0.61	4.86	2.10	1.24	--	3.77	313
A. turnbullii turnbullii	--	.04	--	--	--	--	--	1
Ageneotettix deorum	2.53	17.61	1.08	3.44	.86	3.94	3.77	700
Amphitornus coloradus	--	1.63	--	.05	--	--	.42	43
Arphia pseudonietana	--	.04	--	--	--	--	--	1
A. xanthoptera	--	--	--	--	.10	--	--	1
Aulocara ellioti	1.06	4.84	.54	6.63	.38	.15	.84	327
Boopedon nubilum	--	--	--	.05	--	--	--	1
Boopedon sp.	--	.04	--	--	--	--	--	1
Campylocantha o. olivacea	--	--	.09	--	--	1.17	--	9
Cordillacris crenulata	--	.41	--	--	--	--	--	10
C. o. occipitalis	.12	1.61	.36	.14	--	--	.21	56
Dactyloctenium pictum	.02	--	.27	.19	--	--	--	1
Derotmetma haydenii	.10	--	.09	.19	.19	--	--	14
Dissosteira carolina	.04	.16	--	.10	.48	--	.84	41
D. longipennis	--	--	--	.05	--	--	--	2
Drepanopterna femoratum	--	.69	--	--	--	--	--	18
Encyrtolophus sordidus costalis	--	.32	--	--	--	--	--	3
E. subgracilis texensis Bourn.	--	--	--	--	.10	--	--	1
Hadrotettix trifasciatus	.08	.33	.09	.29	.10	.29	--	22
Hesperotettix speciosus	.08	.57	1.08	.81	--	5.69	--	86
H. viridis	.02	1.02	.81	--	--	--	--	35
Hippiscus rugosus	--	.12	--	--	--	--	.42	5
Hypochlora alba	--	.24	--	--	--	--	--	6
Melanoplus angustipennis	2.26	2.89	3.87	.57	1.00	2.77	.84	274
M. bivittatus	12.92	3.25	12.88	7.35	19.29	8.02	16.56	1371
M. bowditchi	.10	1.38	4.86	.05	.57	3.06	.21	122
M. confusus	.02	.04	--	--	--	--	--	2
M. differentialis	11.99	1.30	18.74	8.11	30.09	13.12	9.01	1469
M. femur-rubrum	6.65	2.24	2.07	1.53	1.43	6.71	18.45	598
M. flavidus	--	--	--	--	--	.58	--	4
M. foedus fluviatilis	.02	--	.09	--	--	--	--	2

Species	Percentage collected in--						Total specimens	Percentage of grand total
	Alfalfa	Plains grass land	Roadside	Small grain	Corn	Idle land	Misc. crops <sup>1/</sup>	
Melanoplus foedus	0.49	3.30	4.86	1.29	0.67	3.35	2.73	1.77
M. gladstoni	.02	.12	--	--	--	--	--	.03
M. infantilis	.06	.08	--	.14	--	--	--	.06
M. lakinus	.47	.08	.27	.24	.19	--	.42	.29
M. mexicanus	28.38	29.09	28.92	46.39	31.33	28.72	24.74	31.59
M. occidentalis	.04	.77	.18	--	--	.15	--	.19
M. packardii	1.92	2.32	2.79	1.72	3.34	4.52	1.68	2.28
M. regalis	--	.12	--	--	--	--	--	.02
Mermiria maculipennis	.20	5.21	1.35	2.10	.88	1.17	2.31	1.73
Mermiria neomexicana	--	.16	--	--	--	--	--	.03
Metator pardalinus	.02	.45	--	--	--	--	--	.09
Nestobregma p. plattei Thos.	--	.08	--	--	--	--	--	.02
Opeia obscura	--	.65	--	--	--	--	--	.12
Orphulella pelidna	--	.69	.36	.24	--	--	--	.20
O. speciosa	--	1.67	--	--	--	--	--	.32
Phlibostroma quadrimaculatum	.02	2.68	--	--	--	--	--	.52
Phoetaliotes nebrascensis	.02	1.46	--	.38	--	.15	--	.35
Pseudopomala brachyptera	--	.12	--	--	--	--	--	.02
Schistocerca alutacea	--	--	.09	--	--	--	--	.01
S. lineata	.02	.12	.09	--	--	--	--	.04
Spharagemon collare	.20	.65	.18	.10	.29	.29	.42	.29
S. equale	.10	.57	.18	.33	--	.29	.21	.24
Syrbula admirabilis	--	.04	--	--	--	--	--	.01
Trachyrhachis kiowa kiowa	.04	1.55	--	--	--	.15	--	.32
Nymphs	2/26.64	6.71	8.92	14.41	7.55	3/15.74	12.16	16.71
Total specimens per environment	5,092	2,458	1,110	2,095	1,047	686	477	--

1/ Potatoes, beets, cane, wheat, corn, and alfalfa.

2/ Approx. 2,000 second-generation nymphs found in alfalfa; not included in percentages.

3/ 111 second-generation nymphs found in idle land; not included in percentages.

NEBRASKA

The percentages of individuals of the various species present in Nebraska, arranged according to crops infested, are summarized as follows:

<u>Alfalfa</u>		<u>Percent</u>	<u>Plains grassland</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	28	1.	Melanoplus mexicanus-----	29
2.	M. bivittatus-----	13	2.	Ageneotettix deorum-----	18
3.	M. differentialis-----	12	3.	Mermiria maculipennis-----	5
4.	M. femur-rubrum-----	7	4.	Aulocara elliotti-----	5
5.	Aeoloplus t. bruneri-----	3	5.	Melanoplus f. foedus-----	3
6.	27 other species-----	57	6.	41 other species-----	40
	Nymphs - 27			Nymphs - 7	
<u>Roadside</u>			<u>Small grain</u>		
1.	Melanoplus mexicanus-----	29	1.	Melanoplus mexicanus-----	46
2.	M. differentialis-----	19	2.	M. differentialis-----	8
3.	M. bivittatus-----	13	3.	M. bivittatus-----	7
4.	Aeoloplus t. bruneri-----	5	4.	Aulocara elliotti-----	7
5.	M. bowditchi-----	5	5.	Ageneotettix deorum-----	3
6.	22 other species-----	29	6.	22 other species-----	29
	Nymphs - 9			Nymphs - 14	
<u>Corn</u>			<u>Idle land</u>		
1.	Melanoplus mexicanus-----	31	1.	Melanoplus mexicanus-----	29
2.	M. differentialis-----	30	2.	M. differentialis-----	13
3.	M. bivittatus-----	19	3.	M. bivittatus-----	8
4.	M. packardii-----	3	4.	M. femur-rubrum-----	7
5.	M. femur-rubrum-----	1	5.	Hesperotettix speciosus-----	6
6.	14 other species-----	16	6.	15 other species-----	37
	Nymphs - 8			Nymphs - 16	
<u>Miscellaneous crops</u>			<u>Percentage of grand total</u>		
1.	Melanoplus mexicanus-----	25	1.	Melanoplus mexicanus-----	32
2.	M. femur-rubrum-----	18	2.	M. differentialis-----	11
3.	M. bivittatus-----	17	3.	M. bivittatus-----	11
4.	M. differentialis-----	9	4.	Ageneotettix deorum-----	5
5.	Aeoloplus t. bruneri-----	4	5.	M. femur-rubrum-----	5
6.	14 other species-----	27	6.	51 other species-----	36
	Nymphs - 12			Nymphs - 17	



NEVADA

This is the first year that collections were made in Nevada during the adult survey. There were 2,487 specimens collected in 4 environments, with the range collection amounting to only 43 specimens. The collections were made in the irrigated-crop districts in what is designated as the northern desert-shrub area. These irrigated fields are subject to invasions from adjacent meadow grasses, where Cannula pellucida often breeds to great numbers locally. In the cropland listed here, Melanoplus devastator was recorded as the dominant species and formed over half of the specimens collected for the State.

General hatching was delayed by adverse weather until the end of May and continued through June. The outlook for 1939 shows Cannula pellucida numerous in grasslands adjacent to crops. Here, in a few places, the egg pods number as high as 350 per square foot.

NEVADA

Distribution by species of 2,487 specimens collected in Nevada, expressed  
in percentage of total number collected in each habitat

Species	Alfalfa clover	Meadow grass	Weeds brush	Range	Total specimens	Percentage of total
<i>Ageneotettix deorum</i> ---	--	--	0.50	--	1	0.04
<i>Arphia pseudonietana</i> ---	0.01	--	--	--	1	.04
<i>Aulocara elliotti</i> ---	.01	--	--	--	1	.04
<i>Aulocara</i> sp.---	.02	6.15	.50	--	23	.92
<i>Camnula pellucida</i> ---	.57	72.00	.99	--	247	9.93
<i>Conozoa sulcifrons</i> Scudd.---	5.93	--	8.45	--	131	5.27
<i>Conozoa</i> sp.---	.99	--	--	--	19	.76
<i>Chortippus longicornis</i> ---	.78	1.85	--	--	21	.84
<i>Dissosteira carolina</i> ---	.01	--	--	--	1	.04
<i>Melanoplus bivittatus</i> ---	.88	.31	.99	--	20	.80
<i>M. devastator</i> ---	63.86	1.54	59.64	90.68	1392	55.95
<i>M. femur-rubrum</i> ---	8.63	6.46	3.48	--	194	7.80
<i>M. mexicanus</i> ---	.31	--	--	--	6	.24
<i>M. packardii</i> ---	6.29	4.31	6.96	--	149	5.99
<i>M. sp.</i> ---	.31	.62	--	--	8	.32
<i>Oedaleonotus enigma</i> ---	--	--	--	2.33	1	.04
<i>Phoetaliotes nebrascensis</i> ---	.62	--	--	--	12	.48
<i>Schistocerca shoshone</i> Thos.---	.94	--	--	--	18	.72
<i>S. lineata</i> ---	--	--	.50	--	1	.04
<i>Spharagemon collar</i> ---	.01	--	--	--	2	.08
<i>Trachyrhachis K. Kiowa</i> ---	--	.62	--	--	2	.08
<i>Trimerotropis caeruleipennis</i> Brun.---	.01	--	--	--	1	.04
<i>T. pallidipennis</i> ---	2.03	2.77	16.40	--	81	3.26
<i>Trimerotropis</i> sp.---	.02	.31	--	--	5	.20
Undetermined specimens---	.47	2.77	--	2.33	19	.76
Nymphs---	6.50	.31	1.49	4.65	131	5.27
Total specimens per environment---	1,918	325	201	43	2,487	--

NEVADA

The percentages of individuals of the various species present in Nevada, arranged according to crops infested, are summarized as follows:

<u>Alfalfa clover</u>	<u>Percent</u>	<u>Meadow grass</u>	<u>Percent</u>
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1. <i>Melanoplus devastator</i> -----	64	1. <i>Camnula pellucida</i> -----	72
2. <i>M. femur-rubrum</i> -----	9	2. <i>Melanoplus femur-rubrum</i> -----	6
3. <i>M. packardii</i> -----	6	3. <i>Aulocara</i> sp.-----	6
4. <i>Conozoa sulcifrons</i> -----	6	4. <i>M. packardii</i> -----	4
5. <i>Trimerotropis pallidipennis</i> -	2	5. <i>Trimerotropis pallidipennis</i> ----	3
6. 15 other species-----	6	6. 6 other species-----	5
7. Undetermined species-----	0.5	7. Undetermined species-----	3
8. Nymphs-----	6.5	8. Nymphs-----	1

Woods and brush

Range

1. <i>Melanoplus devastator</i> -----	60	1. <i>Melanoplus devastator</i> -----	91
2. <i>Trimerotropis pallidipennis</i> -	16	2. <i>Oedaleonotus enigma</i> -----	2
3. <i>Conozoa sulcifrons</i> -----	8	3. Undetermined species-----	2
4. <i>Melanoplus packardii</i> -----	7	4. Nymphs-----	5
5. <i>M. femur-rubrum</i> -----	3		
6. 5 other species-----	4.5		
7. Nymphs-----	1.5		

Grand total

Percent

1. <i>Melanoplus devastator</i> ---	56
2. <i>Camnula pellucida</i> -----	10
3. <i>M. femur-rubrum</i> -----	8
4. <i>M. packardii</i> -----	6
5. <i>Conozoa sulcifrons</i> -----	5
6. 19 other species-----	10
7. Nymphs-----	5



NEW MEXICO

This is the second year in which collections were made in New Mexico during the adult survey. There were 3,526 specimens collected in 7 environments in which 56 species were represented. The dominant species, so far as economic importance is concerned, was Dissosteira longipennis, although this does not show up in the collections. Melanoplus femur-rubrum was the dominant species in alfalfa, corn, idle land, beans, and garden crops. M. mexicanus was the most numerous species in small grains.

Hatching of D. longipennis began about May 1, and continued through June. In the mid-Rio Grande area where M. femur-rubrum, M. differentialis, and M. bivittatus were dominant, hatching began the last week of April. In all areas, hatching was prolonged because of weather conditions.

From the 1938 fall survey it was determined that an area of 1,205,640 acres is known to contain egg beds of D. longipennis, which will produce as large an infestation in 1939 as in 1938, perhaps larger.

Distribution by species of 3,526 specimens collected in New Mexico, expressed in percentage of total numbers collected in each habitat

Species	Grain	Legumes	Range	Corn	Garden	Idle land	Beans	Total specimens	Percentage of total
<i>Aeoloplus turnbulli</i> bruneri	--	--	0.10	--	--	--	--	2	0.06
<i>Ageneotettix deorum</i>	0.58	--	3.80	1.83	--	0.89	1.26	85	2.41
<i>Arphia pseudonietana</i>	--	0.17	.61	--	--	--	--	13	.36
<i>Aulocara elliotti</i>	1.17	--	1.00	.61	--	.59	1.26	27	.76
<i>Boopedon nubilum</i>	--	--	.30	--	--	--	--	6	.17
<i>Brachystola magna</i>	--	--	.05	--	--	--	--	1	.03
<i>Campylacantha olivacea vivax</i>	.58	.17	.36	.91	--	1.79	--	18	.51
<i>Camnula pellucida</i>	--	--	.05	--	--	--	--	1	.03
<i>Cordillacris crenulata</i>	--	--	2.88	--	--	--	--	56	1.58
<i>C. occipitalis</i>	--	--	.72	--	--	--	--	14	.39
<i>Cryptopedes neglectus</i>	.58	--	--	--	--	--	--	1	.03
<i>Dactyloctenium pictum</i>	--	--	.20	--	--	--	--	4	.11
<i>Derotmema</i> sp.	--	--	.50	--	--	--	--	10	.28
<i>D. laticinctum</i> Scudd.	--	--	.05	--	--	--	--	1	.03
<i>D. haydenii</i>	.58	--	1.85	--	--	.89	--	40	1.13
<i>Dissosteira carolina</i>	.58	--	--	--	--	--	1.26	2	.06
<i>D. longipennis</i>	1.17	--	15.43	--	--	--	--	302	8.56
<i>Drepanopterna femoratum</i>	--	--	7.09	.61	--	1.49	1.26	146	4.14
<i>Encoptolophus sordidus costalis</i>	.58	.17	4.11	.61	--	--	2.53	87	2.46
<i>Hadrotettix trifasciatus</i>	--	--	.87	--	--	--	--	17	.48
<i>Hesperotettix viridis</i>	.58	--	.05	--	--	--	--	2	.06
<i>Deprus</i> sp.	--	--	.15	--	--	--	--	3	.08
<i>Melanoplus angustipennis</i>	--	--	.46	--	--	--	--	9	.25
<i>M. arizonae</i> Scudd.	--	--	.87	2.14	--	2.38	--	32	.90
<i>M. bivittatus</i>	5.29	2.91	--	9.17	7.90	--	3.79	66	1.87
<i>M. bowditchi</i>	4.70	.51	.30	.30	--	.59	--	20	.56
<i>M. differentialis</i>	1.17	16.63	.36	25.38	26.13	2.38	8.86	227	6.43
<i>M. femur-rubrum</i>	17.64	53.00	.77	28.74	38.63	51.34	48.10	692	19.62
<i>M. foedus</i>	4.70	--	.25	--	--	--	--	13	.36
<i>M. gladstoni</i>	4.11	.17	7.97	1.52	--	.89	1.26	172	4.87
<i>M. infantilis</i>	--	--	.46	--	--	--	--	9	.25

## Nex Mexico (Continued)

Species	Grain	Legumes	Range	Corn	Garden	Idle land	Beans	Total specimens	Percentage of total
Melanoplus lakinus	15.88	9.43	.66	7.95	10.22	12.83	18.98	188	5.33
M. mexicanus	30.58	2.40	1.64	--	--	2.98	--	108	3.06
M. occidentalis	--	--	1.08	.61	--	.89	2.53	28	2.79
M. packardii	2.35	.17	4.37	3.85	--	1.19	--	104	2.94
M. pictus Scudd.	--	--	.05	--	--	--	--	1	.03
M. regalis	--	--	.36	--	--	--	--	7	.19
Mestobregma plattei	--	--	.40	--	--	--	--	8	.22
Mermiria maculipennis	--	--	.05	--	--	--	--	1	.03
Metator pardalinus	--	--	.25	--	--	--	--	5	.14
Opeia obscura	--	--	5.04	--	--	3.28	--	109	3.09
Orphulella pelidha	--	--	--	.61	--	--	--	2	.06
Phibostroma quadrimaculatur	--	--	5.55	.30	--	1.19	--	113	3.20
Phoetaliotes nebrascensis	--	.34	--	.30	--	.59	--	5	.14
Psoboessa sp.	.58	--	--	--	--	--	--	1	.03
Schistocerca lineata	--	.17	.99	1.83	--	--	--	26	.73
Spharagemon collare	--	.17	.15	.30	--	--	1.26	6	.17
S. equale	--	--	.30	--	--	--	--	6	.17
Syrbula admirabilis	--	--	.10	--	--	--	--	2	.06
Trachyrhachis k. kiowa	--	--	3.39	--	--	--	--	66	1.87
T. k. fuscifrons	--	.17	--	--	--	--	--	1	.03
Trachyrhachis sp.	--	--	1.33	--	--	--	--	26	.73
Trimerotropis gracilis Thos.	--	--	.05	--	--	--	--	1	.03
T. laticincta	--	--	.90	--	--	.59	--	20	.56
T. melanoptera	--	--	2.00	--	--	--	--	39	1.10
T. pallidipennis	--	1.20	1.59	.61	--	--	2.53	42	1.19
Tropidolophus formosus Say	--	--	.51	.30	--	--	--	12	.34
Xanthippus corallipes	--	--	.15	--	--	--	--	3	.08
Undetermined	--	--	1.38	.61	--	.59	--	31	.87
Nymphs	6.47	12.00	15.79	11.62	17.04	12.53	5.06	487	13.81
Total specimens per environment	170	583	1,944	327	88	335	79	3,526	--



# NEW MEXICO

The percentages of individuals of the various species present in New Mexico, arranged according to crops infested, are summarized as follows:

<u>Grains</u>		<u>Percent</u>	<u>Legumes</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	31	1.	Melanoplus femur-rubrum-----	56
2.	M. femur-rubrum-----	18	2.	M. differentialis-----	17
3.	M. lakinus-----	16	3.	M. lakinus-----	9
4.	M. foedus foedus-----	5	4.	M. bivittatus-----	6
5.	M. gladstoni-----	4	5.	M. mexicanus-----	2
6.	Other species (14)-----	20	6.	Other species (11)-----	4
7.	Nymphs-----	6	7.	Nymphs-----	12
<u>Range</u>			<u>Corn</u>		
1.	Dissosteira longipennis ----	15	1.	Melanoplus femur-rubrum-----	29
2.	M. gladstoni-----	3	2.	M. differentialis-----	25
3.	Drepanopterna femoratum-----	7	3.	M. bivittatus-----	9
4.	Phlibostrona quadrimaculatum	6	4.	M. lakinus-----	8
5.	Opeia obscura-----	5	5.	M. packardii-----	3
6.	Other species (43)-----	42	6.	Other species-----	13
7.	Nymphs and unidentified-----	17	7.	Nymphs and unidentified ----	15
<u>Garden</u>			<u>Idle</u>		
1.	Melanoplus femur-rubrum ----	39	1.	Melanoplus femur-rubrum-----	51
2.	M. differentialis-----	26	2.	M. lakinus-----	13
3.	M. lakinus-----	10	3.	Opeia obscura-----	3
4.	M. bivittatus-----	8	4.	M. mexicanus-----	3
5.	Nymphs-----	17	5.	M. differentialis-----	2
			6.	Other species (13)-----	14
			7.	Nymphs and unidentified-----	14
<u>Beans</u>			<u>Summary</u>		
1.	Melanoplus femur-rubrum-----	48	1.	Melanoplus femur-rubrum-----	20
2.	M. lakinus-----	19	2.	Dissosteira longipennis ----	9
3.	M. differentialis-----	9	3.	M. differentialis-----	6
4.	M. bivittatus-----	4	4.	M. lakinus-----	5
5.	Other species (9)-----	15	5.	M. gladstoni-----	5
6.	Nymphs-----	5	6.	Other species (53)-----	40
			7.	Nymphs and unidentified-----	15

## NORTH DAKOTA

During the last 5 years, 1934-38, inclusive, collections of grasshoppers in typical environments have been made in North Dakota during the adult survey. In 1938, 20,634 specimens were collected in 9 typical environments, 41 species being represented in these collections. In all environments Melanoplus mexicanus was easily the dominant grasshopper making up half of the total specimens collected in the State. It far outnumbered any of the other species, forming from 24 to 68 percent of the populations in the different habitats. M. packardii was second in number in the total number of specimens collected, although Camula pellucida and Ageneotettix deorum were greater in numbers than was M. packardii in some of the environments. In 1934, M. mexicanus was the dominant species on the range in the northwestern part of the State and A. deorum was the most numerous in the southwestern quarter. During 1935, 1936, and 1937, A. deorum became the leading species on the range, easily outnumbering M. mexicanus. In 1938 M. mexicanus became the most important species on the range land at 32 percent and A. deorum was second at 18 percent of the total specimens collected. This was probably due to the extensive major and local migrations of M. mexicanus during July and August. M. bivittatus is building up again after its great reduction during the extreme drought of 1934. M. differentialis, not being as hardy as M. bivittatus, is still down in numbers.

Hatching began about April 23 in the southern counties. Cold rainy weather prolonged hatching and hatching was still going on in the northern counties at the end of June. During July and the first part of August major flights of M. mexicanus moved in and out of the State. Grasshoppers in the south-central counties moved into the northeastern part of the State. Those in the western part moved northward into Canada and northwestward into eastern Montana. Grasshoppers from South Dakota moved northwestward into the Dickinson-Mandan area, reinfesting a large area there and destroying small-grain crops by cutting off the heads. Flights were so general and so dense that it was impossible to do anything about it. Heavy egg deposition occurred in areas where these flights terminated, although beefly larvae, according to the egg survey, had reduced the good eggs 25 to 75 percent. The worst infestations are in the Dickinson-Mandan area and egg counts run high. It is problematical how much good the egg predators will do. This is an old grasshopper area and egg predators are well established. They may at least cut down on the occurrence of the enormous populations necessary to produce major flights, such as those experienced in 1938.

# NORTH DAKOTA

Distribution by species of 20,634 specimens collected in North Dakota, expressed  
in percentage of total number collected in each habitat

Species	Percentage collected in--						Total specimens	Percentage of grand total
	Small grain	Legumes	Pasture	Rever- sion	Weedy	Roadside Soddy		
							Flax	
Acrolophitus hirtipes	--	--	--	--	--	--	--	0.01
Acoloplus turnbullii	--	--	--	.71	1.65	--	--	.21
Aeropedellus clavatus	--	0.03	1.08	.04	.10	1.07	--	.22
Ageneotettix deorum	0.40	1.14	4.71	4.52	1.36	18.93	--	3.51
Amphitornus coloradus	.05	.03	1.89	.08	.39	4.80	--	.80
Aulocara elliotti	.23	.06	.40	.40	1.69	5.60	--	.94
Bruneria brunnea	--	--	--	--	--	.27	--	.01
Camula pellucida	1.95	2.68	14.34	1.51	3.10	12.27	1.13	4.12
Chloealtis conspersa	--	--	--	.08	--	.27	--	.01
Chortippus longicornis	.05	.09	1.78	.24	--	--	.23	.37
Cordillacris occipitalis	--	--	--	--	.05	--	--	.02
Derotmema haydenii haydenii	--	.03	--	.04	.24	--	--	.03
Dissosteira carolina	.20	--	--	.04	.63	.53	--	.19
Drepanopterna femoratum	.02	--	--	--	.10	.27	--	.03
Encoptolophus sordidus sordidus	--	--	--	.04	--	--	--	.01
E. s. costalis	.02	--	--	--	--	--	--	.01
Hadrotettix trifasciatus	--	--	--	.32	.53	--	--	.14
Hesperotettix viridis	.02	.03	.40	.67	.48	.27	--	.26
Hypochochloa alba	--	--	.17	.08	.05	--	--	.04
Melanoplus angustipennis	1.58	.30	1.38	.99	2.91	--	--	1.26
M. bivittatus	2.50	2.92	1.14	2.26	3.97	.80	1.35	2.48
M. confusus	--	--	.10	.12	.34	.27	--	.09
M. dawsoni	.13	.03	1.58	2.38	.05	.27	--	.61
M. differentialis	.25	--	--	--	--	--	--	.08
M. femur-rubrum	1.75	.93	.88	1.62	.73	--	1.81	1.14
M. flavidus flavidus	--	--	--	--	.10	--	--	.01
M. gladstoni	--	--	--	.04	--	--	--	.01
M. infantilis	.06	.21	1.28	.32	.19	1.33	--	.62
M. mexicanus	60.03	41.24	33.03	50.72	55.05	23.73	67.72	48.68
M. occidentalis	--	--	--	.04	.14	--	--	.05



NORTH DAKOTA (Continued)

Species	Percentage collected in--										Total specimens	Percentage of grand total
	Small grain	Legumes	Pasture	Rever- sion	Weedy	Roadside	Soddy	Range	Corn	Flax		
Melanoplus packardii	8.02	4.60	1.65	4.32	4.99	5.07	5.07	2.04	6.01	1.81	1,040	5.03
Mermiria maculipennis macclungi	--	--	--	--	.19	--	--	.06	--	--	5	.02
Metator pardalinus	.09	--	1.68	.52	1.69	3.20	3.20	6.54	.12	--	226	1.09
Opeia obscura	--	--	--	--	--	--	--	.06	--	--	1	.01
Orphulella speciosa	--	--	.07	--	--	--	--	.18	--	--	5	.02
Pardalophora haldemani	--	--	--	--	--	--	--	.30	--	--	5	.02
Phibostroma quadrimaculatum	--	--	.10	--	.10	2.93	2.93	4.44	--	--	90	.44
Phoetaliotes nebrascensis	--	--	--	--	.05	--	--	--	--	--	1	.01
Spharagemon collare	.64	.36	.54	.59	.82	.27	.27	.24	.23	.23	109	.53
S. equale	--	.03	--	.08	.19	--	--	.06	--	--	2	.04
Trachyrhachis kiowa	--	.09	1.38	.16	.19	.80	.80	2.10	--	--	90	.44
Nymphs	21.06	45.13	30.40	27.07	17.92	17.07	17.07	11.76	20.11	25.73	5411	26.19
Total specimens per environment	6,395	3,524	2,970	2,523	2,065	375	375	1,667	865	443	20,627	--

# NORTH DAKOTA

The percentages of individuals of the various species present in North Dakota, arranged according to crops infested, are summarized as follows:

<u>Small grain</u>		<u>Percent</u>	<u>Legumes</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	60	1.	Melanoplus mexicanus-----	41
2.	M. packardii-----	8	2.	M. packardii-----	5
3.	M. bivittatus-----	3	3.	M. bivittatus-----	3
4.	Camnula pellucida-----	2	4.	Camnula pellucida-----	3
5.	M. femur-rubrum-----	2	5.	Ageneotettix deorum-----	1
6.	15 other species-----	25	6.	13 other species-----	47
	Nymphs - 22			Nymphs - 45	
<u>Pasture</u>			<u>Reversion</u>		
1.	Melanoplus mexicanus-----	33	1.	Melanoplus mexicanus-----	51
2.	Camnula pellucida-----	14	2.	Ageneotettix deorum-----	5
3.	Ageneotettix deorum-----	5	3.	M. packardii-----	4
4.	Amphitornus coloradus-----	2	4.	M. dawsoni-----	2
5.	M. packardii-----	2	5.	M. bivittatus-----	2
6.	18 other species-----	44	6.	25 other species-----	36
	Nymphs - 30			Nymphs - 27	
<u>Weedy roadside</u>			<u>Soddy roadside</u>		
1.	Melanoplus mexicanus-----	55	1.	Melanoplus mexicanus-----	24
2.	M. packardii-----	5	2.	Ageneotettix deorum-----	19
3.	M. bivittatus-----	4	3.	Camnula pellucida-----	12
4.	Camnula pellucida-----	3	4.	Aulocara elliotti-----	6
5.	M. angustipennis-----	3	5.	M. packardii-----	5
6.	20 other species-----	30	6.	15 other species-----	34
	Nymphs - 18			Nymphs - 17	
<u>Range</u>			<u>Corn</u>		
1.	Melanoplus mexicanus-----	32	1.	Melanoplus mexicanus-----	61
2.	Ageneotettix deorum-----	18	2.	M. bivittatus-----	7
3.	Metator pardalinus-----	7	3.	M. packardii-----	6
4.	Aulocara elliotti-----	6	4.	M. angustipennis-----	2
5.	Amphitornus coloradus-----	5	5.	Camnula pellucida-----	1
6.	26 other species-----	32	6.	10 other species-----	23
	Nymphs - 12			Nymphs - 20	
<u>Flax</u>			<u>Grand total</u>		
1.	Melanoplus mexicanus-----	68	1.	Melanoplus mexicanus-----	49
2.	M. femur-rubrum-----	2	2.	M. packardii-----	5
3.	M. packardii-----	2	3.	Camnula pellucida-----	4
4.	M. bivittatus-----	1	4.	Ageneotettix deorum-----	4
5.	Camnula pellucida-----	1	5.	M. bivittatus-----	2
6.	2 other species-----	26	6.	40 other species-----	36
	Nymphs - 26.			Nymphs - 26	

OKLAHOMA

This is the second year in which collections were made in Oklahoma during the adult survey. In 1937 a special project was set up by the entomology department of the A & M College at Stillwater, whereby collections of hoppers were made and classified in specified environments. These, added to the collections made by surveyors in the adult survey, gave a complete picture of the distribution of species in the State that year. In 1938 the regular surveyors made the collections and only about half as many were collected as in 1937. There were 4,820 specimens collected in 9 environments and 53 species were represented. About 2 percent of the total specimens collected were undetermined nymphs. In everything but the range land the dominant species was Melanoplus differentialis. Outside of the Panhandle counties M. packardii was the most numerous species on the prairie. In the crop land M. differentialis made up one-half of the grasshoppers. M. mexicanus was second only in the alfalfa, with M. packardii second in numbers for small grains and probably other crops. There seems to be little change in the relative numbers of the more important species. Aulocara elliotti does not seem to have been so numerous in 1938 as in 1937, but Aeoloplus turnbullii has increased in importance. In the extreme western counties of the Panhandle, Dissosteira longipennis moved in late in July and deposited eggs along fence rows of cropped areas and in the corn and sorghum stubble, as well as a small portion of the range land.

Hatching of M. bivittatus and M. mexicanus began the last of March, adults of M. mexicanus being noted by the first week of May. Owing to continuous rains, fungous and bacterial disease reduced the population. The grasshopper potential for the fall of 1938 is about half what it was in 1937. In 1939 the greatest trouble will probably be in the Panhandle area, where D. longipennis is dominant.



Distribution by species of 4,820 specimens collected in Oklahoma, expressed in percentage of total number collected in each habitat

Species	Percentage collected in --								Total specimens	Percentage of grand total
	Range	Alfalfa	Small grain	Weedy patches	Misc. crops	Sorghums	Roadside	Cotton	River bottom	Corn
<i>aeolopus turnbullii bruneri</i>	0.52	3.83	2.06	14.25	1.99	0.93	2.45	3.91	1.60	--
<i>Ageneotettix deorum</i>	3.56	.26	.15	.39	--	.23	--	--	7.45	--
<i>Amphitornus coloradus</i>	.52	--	--	--	--	--	--	--	--	--
<i>Arphia simplex</i>	.10	.13	--	--	.40	--	--	--	--	--
<i>Aulocara ellioti</i>	3.98	--	2.51	.19	.40	.47	.92	--	--	--
<i>Boopodon maculatum</i>	1.99	--	.15	--	--	.23	--	--	--	--
<i>B. nubilum</i>	.10	--	--	--	.20	--	--	--	--	--
<i>Brachystola magna</i>	--	--	--	--	--	--	.31	--	--	--
<i>Campylacantha o. olivacea</i>	.18	--	--	.19	--	--	.61	--	--	--
<i>Chortothaga viridifasciata</i>	.84	.26	1.03	--	--	.23	--	.98	--	1.53
<i>Dissosteira carolina</i>	.10	.26	--	.19	.20	--	--	--	--	--
<i>Dissosteira longipennis</i>	1.57	--	.88	1.35	--	1.40	1.22	1.95	--	--
<i>Encyrtolophus pallidus subgracilis</i>	--	--	.74	--	.20	--	--	1.95	--	--
<i>Caud.</i>	3.56	--	.29	.39	.40	.70	.92	--	--	--
<i>Hadrotettix trifasciatus</i>	1.15	.51	1.18	1.16	.60	1.40	3.98	2.28	2.13	.76
<i>Hesperotettix speciosus</i>	1.57	--	.44	2.31	--	--	.61	.65	.53	--
<i>H. viridis</i>	1.68	--	.29	--	--	--	--	--	--	--
<i>Hippiscus rugosus</i>	.21	--	--	--	--	--	--	--	--	--
<i>Hypochoera alba</i>	4.40	3.57	2.21	1.35	1.79	6.74	3.06	1.30	13.30	3.05
<i>Melanoplus angustipennis impiger</i>	2.20	.26	.15	.77	--	.93	--	--	--	1.53
<i>Scudd.</i>	.42	1.28	.29	.19	.20	--	.31	.33	--	.76
<i>M. arizonae</i>	3.35	8.05	7.08	9.25	6.96	4.88	10.09	3.58	6.91	12.21
<i>M. bispinosus Scudd.</i>	6.08	45.85	44.69	34.10	49.30	52.09	34.25	47.56	19.68	49.62
<i>M. bivittatus</i>	--	--	.15	--	--	--	.61	--	2.66	--
<i>M. bowditchi</i>	.10	--	.29	1.16	.40	--	--	.33	--	1.53
<i>M. differentialis</i>	--	.13	--	.39	--	--	--	--	1.06	3.05
<i>M. femur-rubrum</i>	.21	--	.74	3.08	.80	.23	--	.55	1.60	--
<i>M. flavidus</i>	--	--	--	--	--	--	--	--	--	--
<i>M. f. fluviatilis</i>	--	--	--	--	--	--	--	--	--	--
<i>M. f. foedus</i>	--	--	--	--	--	--	--	--	--	--

Species	Percentage collected in--										Total specimens	Percent- age of grand total
	Range	Alfalfa	Small grain	Weedy patches	Misc. crops	Sorghums	Roadside	Cotton	River bottom	Corn		
<i>Melanoplus foedus iselyi</i> ----	2.20	2.43	2.80	.95	6.16	3.49	3.98	1.30	16.49	11.45	173	3.59
<i>M. glaucipes</i> Scudd.----	.52	--	--	--	--	.47	.31	--	1.06	.76	11	.23
<i>M. lakinus</i> ----	.31	1.02	1.33	4.43	1.39	.47	.92	1.63	.53	--	61	1.27
<i>M. mexicanus</i> ----	2.83	15.45	3.54	8.28	2.39	4.42	10.40	1.63	3.72	--	292	6.06
<i>M. packardii</i> ----	28.72	8.30	19.03	14.45	22.27	15.35	20.80	14.33	9.57	4.58	857	17.77
<i>M. ponderosus</i> Scudd.----	1.68	.13	.15	--	--	--	.31	--	.53	4.58	26	.54
<i>M. regalis</i> Dodge----	.84	--	.15	--	--	--	--	--	--	--	9	.19
<i>Mermiria maculipennis</i> ----	6.81	.13	1.77	--	1.59	1.40	.61	1.63	4.79	--	108	2.38
<i>M. neomexicana</i> ----	.21	--	--	--	--	--	.31	--	--	--	3	.06
<i>Opeia obscura</i> ----	.52	--	--	--	--	--	--	--	--	--	5	.10
<i>Orphulella speciosa</i> ----	.21	.13	--	--	--	--	--	.65	--	--	5	.10
<i>Pardalophora haldemani</i> ----	.31	.13	.15	--	--	--	--	--	--	--	5	.10
<i>Xanthippus corallipes pantherinus</i> Scudd.----	1.89	.13	--	.19	.40	.47	--	.98	--	--	27	.56
<i>Phlibostroma quadrimaculatum</i> ----	6.39	--	--	--	--	--	--	--	--	--	61	1.27
<i>Schistocerca a. americana</i> ----	--	.13	.29	--	--	--	--	--	--	--	3	.06
<i>S. obscura</i> ----	--	--	--	--	--	--	--	3.58	--	1.53	13	.27
<i>S. shoshone</i> ----	--	--	--	--	--	--	--	.33	--	--	1	.02
<i>S. lineata</i> ----	.10	--	.29	--	--	.23	--	1.30	.53	--	9	.19
<i>Spharagemon collare</i> ----	.42	.26	.29	--	--	.23	.31	.33	1.60	1.53	16	.33
<i>S. equale</i> ----	1.05	.26	1.33	.77	1.39	.47	--	.33	--	--	35	.73
<i>Syrbula admirabilis</i> ----	4.09	.77	.88	.19	--	.47	.92	3.26	3.19	--	73	1.51
<i>Trachyrhachis kiowa fuscifrons</i> ----	.10	--	--	--	--	--	--	--	--	--	1	.02
<i>Trimerotropis latifasciata</i> laticincta----	--	--	--	--	.40	--	--	--	--	--	3	.06
<i>T. pallidipennis</i> ----	--	--	--	--	--	.23	.31	--	--	--	2	.04
<i>T. citrina</i> Scudd.----	--	--	--	--	--	--	--	.98	1.06	1.53	7	.15
Undetermined----	.31	.38	.88	--	.20	1.40	.31	.98	--	--	23	.48
Nymphs----	2.10	6.00	1.77	--	--	.47	--	.98	--	--	84	1.74
Total specimens per environment	954	783	678	519	503	430	327	307	188	131	4,820	--

1/ Sorghum, cotton, wheat, corn, and alfalfa.

# OKLAHOMA

The percentages of individuals of the various species present in Oklahoma, arranged according to crops infested, are summarized as follows:

<u>Range</u>	<u>Percent</u>	<u>Alfalfa</u>	<u>Percent</u>
1. <i>Melanoplus packardii</i> -----	29	1. <i>Melanoplus differentialis</i> ----	46
2. <i>Mermiria maculipennis</i> -----	7	2. <i>M. mexicanus</i> -----	15
3. <i>Phlibostroma quadrimaculatum</i>	6	3. <i>M. packardii</i> -----	8
4. <i>Melanoplus differentialis</i> --	6	4. <i>M. bivittatus</i> -----	8
5. <i>M. angustipennis impiger</i> ---	4	5. <i>Aeoloplus t. bruneri</i> -----	4
6. 38 other species-----	48	6. 20 other species-----	19
Nymphs - 2		Nymphs - 6	

<u>Small grain</u>		<u>Weedy patches</u>	
1. <i>Melanoplus differentialis</i> --	45	1. <i>Melanoplus differentialis</i> ----	34
2. <i>M. packardii</i> -----	19	2. <i>M. packardii</i> -----	14
3. <i>M. bivittatus</i> -----	7	3. <i>Aeoloplus t. bruneri</i> -----	14
4. <i>M. mexicanus</i> -----	4	4. <i>M. bivittatus</i> -----	9
5. <i>M. f. iselyi</i> -----	3	5. <i>M. mexicanus</i> -----	8
6. 27 other species-----	22	6. 19 other species-----	21
Nymphs - 2		Nymphs - none	

<u>Miscellaneous crops</u>		<u>Sorghums</u>	
1. <i>Melanoplus differentialis</i> --	49	1. <i>Melanoplus differentialis</i> ----	52
2. <i>M. packardii</i> -----	22	2. <i>M. packardii</i> -----	15
3. <i>M. bivittatus</i> -----	7	3. <i>M. a. impiger</i> -----	7
4. <i>M. f. iselyi</i> -----	6	4. <i>M. bivittatus</i> -----	5
5. <i>M. mexicanus</i> -----	2	5. <i>M. mexicanus</i> -----	4
6. 18 other species-----	14	6. 20 other species-----	17
Nymphs - none		Nymphs - 0.47	

<u>Roadside</u>		<u>Cotton</u>	
1. <i>Melanoplus differentialis</i> --	34	1. <i>Melanoplus differentialis</i> ----	48
2. <i>M. packardii</i> -----	21	2. <i>M. packardii</i> -----	14
3. <i>M. mexicanus</i> -----	10	3. <i>Aeoloplus t. bruneri</i> -----	4
4. <i>M. bivittatus</i> -----	10	4. <i>M. bivittatus</i> -----	4
5. <i>M. f. iselyi</i> -----	4	5. <i>Schistocerca obscura</i> -----	4
6. 20 other species-----	21	6. 24 other species-----	26
Nymphs - none		Nymphs - 0.98	

<u>River bottom</u>		<u>Corn</u>	
1. <i>Melanoplus differentialis</i> --	20	1. <i>Melanoplus differentialis</i> ----	50
2. <i>M. f. iselyi</i> -----	16	2. <i>M. bivittatus</i> -----	12
3. <i>M. a. impiger</i> -----	13	3. <i>M. f. iselyi</i> -----	11
4. <i>M. packardii</i> -----	10	4. <i>M. packardii</i> -----	5
5. <i>Ageneotettix deorum</i> -----	7	5. <i>M. ponderosus</i> -----	5
6. 16 other species-----	34	6. 11 other species-----	17
Nymphs - none		Nymphs - none	



OKLAHOMA (Continued)

Percentage of grand total

1.	Melanoplus differentialis-----	36
2.	M. packardii-----	18
3.	M. bivittatus-----	7
4.	M. mexicanus-----	6
5.	M. angustipennis impiger-----	4
6.	48 other species-----	29
	Nymphs - 1.74	

OREGON

This is the first year that collections from Oregon were included in this project. The natural vegetation areas found in this State are the northern desert shrub in the eastern half and the western pine forest in the western half. There were 1,096 specimens collected in 4 environments in which 13 species are represented. Melanoplus mexicanus was the dominant species by far, except in the marsh-meadow land, where Camnula pellucida was dominant. M. foedus foedus was third in numbers.

Hatching began late in May and continued through June. Infestations are of M. mexicanus and Camnula pellucida and occur in widely separated areas. C. pellucida on the Klamath Marsh has been greatly reduced by the control campaign. This is the area where this species reaches its greatest numbers.

OREGON

Distribution by species of 1,096 specimens collected in Oregon, expressed in percentage of total numbers collected in each habitat

Species	Alfalfa and clover	Small grain	Idle land	Meadow marsh	Total specimens	Percentage of total
Aulocara ellioti-----	0.48	1.73	1.86	--	9	0.82
Cannula pellucida-----	1.44	.43	--	94.16	139	12.68
Conozoa sp.-----	7.68	.86	18.69	--	70	6.38
Dissosteira carolina-----	5.44	--	--	--	34	3.10
Melanoplus bivittatus-----	7.68	.43	--	--	49	4.47
M. cinereus Scudd.-----	.16	--	13.08	--	15	1.36
M. devastator-----	2.06	5.65	--	1.45	28	2.55
M. femur-rubrum-----	4.96	.86	--	--	33	3.01
M. foedus-----	15.68	2.17	9.34	2.91	117	10.67
M. mexicanus-----	43.68	80.43	5.60	1.45	466	42.42
Oedaleonotus enigma-----	.96	--	51.40	--	61	5.56
Phoetaliotes nebrascensis-----	.32	--	--	--	2	.18
Trimerotropis sp.-----	.16	--	--	--	1	.09
Undetermined-----	.32	--	--	--	2	.18
Nymphs-----	8.48	7.39	--	--	70	6.38
Total specimens per en- vironment-----	622	230	107	137	1,096	--



OREGON

The percentages of individuals of the various species present in Oregon, arranged according to crops infested, are summarized as follows:

<u>Alfalfa and clover</u>		<u>Percent</u>	<u>Small grain</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	44	1.	Melanoplus mexicanus-----	81
2.	M. foedus foedus-----	16	2.	M. devastator-----	6
3.	Conozoa sp.-----	8	3.	M. foedus foedus -----	2
4.	M. bivittatus-----	7	4.	Aulocara ellioti-----	2
5.	Dissosteira carolina-----	5	5.	Conozoa sp.-----	1
6.	Other species (8) & unident.--	11	6.	Other species (3) & Unident.	1
7.	Nymphs-----	9	7.	Nymphs-----	7

<u>Idle land</u>			<u>Meadow marsh</u>		
1.	Oedaleonotus enigma-----	52	1.	Camnula pellucida-----	95
2.	Conozoa sp.-----	18	2.	Melanoplus foedus foedus---	3
3.	Melanoplus cinereus-----	13	3.	M. mexicanus-----	1
4.	M. foedus foedus-----	9	4.	M. devastator-----	1
5.	M. mexicanus-----	6			
6.	Aulocara ellioti-----	2			

<u>Summary</u>		<u>Percent</u>
1.	Melanoplus mexicanus--	43
2.	Camnula pellucida----	13
3.	M. feodus foedus ----	11
4.	Conozoa sp.-----	6
5.	M. bivittatus-----	4
6.	Other sp. (9) & unident.	17
7.	Nymphs-----	6

## SOUTH DAKOTA

During the adult surveys in 1934-38, inclusive, collections of grasshoppers have been made in the major environments found in South Dakota. There were 15,105 specimens collected in 1938 in 7 major environments, representing 47 different species. Melanoplus mexicanus was easily the dominant grasshopper, constituting 61 percent of the specimens collected in small grain and idle land, 37 percent in alfalfa, and 40 percent of the total number of specimens collected in the State. M. bivittatus was second in numbers for the entire State collection but was first, at 31 percent, in corn. Ageneotettix deorum and Aulocara elliotti were about equal in numbers, at third place. After the 1931 outbreaks of M. bivittatus and M. differentialis these two species were greatly reduced in numbers by the drought years which followed. Since that time M. mexicanus has been increasing in relative numbers every year, until it reached its peak in 1938. Populations of this species from 1,500 to 8,000 per square yard were recorded in crop land, idle land, and depleted range land adjacent to crops in the north-central counties. These produced major flights in July that swarmed into North Dakota, eastern Montana, western South Dakota, and eastern Wyoming. Fall egg surveys in 1938 indicated that this general movement has reduced the relative numbers of M. mexicanus in this and other areas in the eastern half of South Dakota and that there is an increase in both M. bivittatus and M. differentialis to equal or supplant M. mexicanus in importance. In the western counties M. mexicanus is still the dominant grasshopper, because this area received part of the great flights. There was heavy egg deposition in the Black Hills area. The Lyman, Tripp, and Gregory County area show M. differentialis as decidedly on the increase. This was the center of the 1931 outbreak. All through the eastern part of the State the fall egg surveys showed mixed populations of M. mexicanus, M. bivittatus, and M. differentialis.

Hatching began the last week of April and was prolonged throughout June. Flights began the last week of June and continued throughout July and part of August. These were mostly in a northerly, northwesterly, or westerly direction. The almost solid infestation east of Missouri River has been broken up into patchy mixed infestations.

## SOUTH DAKOTA

Distribution by species of 15,105 specimens collected in South Dakota, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--						Irrigation ditches	Total specimens	Percentage of grand total
	Plains grassland	Small grain	Idle land	Weedy roadside	Legumes	Corn			
<i>Aeoloplus t. turnbullii</i>	0.91	0.91	2.92	0.68	--	0.71	1.18	168	1.11
<i>Aeropedellus clavatus</i>	.04	--	--	--	--	--	--	2	.01
<i>Ageneotettix deorum</i>	20.08	2.55	1.72	3.59	2.59	.27	.59	1,139	7.54
<i>Amphitornus coloradus</i>	4.64	.27	.04	.20	--	--	--	224	1.48
<i>Arphia pseudonietana</i>	.04	.02	--	--	--	--	--	3	.02
<i>Aulocara eliotti</i>	18.00	6.28	2.06	4.67	1.65	.88	10.59	1,249	8.27
<i>Boopedon nubilum</i>	.16	--	--	--	--	--	--	7	.05
<i>Camula pellucida</i>	.89	1.14	.04	--	.31	.80	.88	103	.68
<i>Chortippus longicornis</i>	.04	.02	--	.07	--	--	--	4	.03
<i>Cordillacris crenulata</i>	.09	--	--	--	--	--	--	4	.03
<i>C. o. occipitalis</i>	.44	--	--	--	--	--	--	20	.13
<i>Dactyloctenium pictum</i>	.02	--	--	--	--	--	--	1	.01
<i>Derotymema haydenii</i>	--	.67	.30	.34	--	.18	--	17	.11
<i>Lissosteira carolina</i>	--	.52	.04	--	--	.71	1.18	34	.23
<i>Trepanopterna femoratum</i>	1.49	.05	.09	.27	--	.09	--	76	.50
<i>Hadrotettix trifasciatus</i>	.20	.42	.17	1.08	.16	.35	.29	53	.35
<i>H. speciosus</i>	.18	.02	.04	.41	--	.62	4.41	38	.25
<i>H. viridis</i>	.55	.02	.09	2.91	.08	.27	.59	77	.51
<i>Hippiscus rugosus</i>	.02	--	--	--	--	--	--	1	.01
<i>Hypochlora alba</i>	.11	.02	--	--	--	--	.29	7	.05
<i>Melanoplus angustipennis</i>	.11	.30	.13	2.98	.16	.53	--	72	.48
<i>M. bivittatus</i>	1.38	6.84	7.72	12.87	11.37	31.24	23.82	1,288	8.53
<i>M. confusus</i>	.09	.25	.34	--	.39	.27	--	30	.20
<i>M. dawsoni</i>	.33	--	--	.07	.16	--	--	18	.12
<i>M. differentialis</i>	.33	1.43	.21	1.29	3.45	16.46	4.41	342	2.26
<i>M. femur-rubrum</i>	.44	1.80	1.89	2.71	7.76	.97	7.35	312	2.07
<i>M. foedus fluviatilis</i>	.42	.05	--	.07	--	--	.59	24	.16
<i>M. foedus foedus</i>	--	--	--	.07	--	--	--	1	.01
<i>M. infantilis</i>	1.31	.32	.34	.20	.24	.35	--	90	.60



## SOUTH DAKOTA (Continued)

Species	Percentage collected in--							Total specimens	Percentage of grand total
	Plains grassland	Small grain	Idle land	Weedy roadside	Legumes	Corn	Irrigation ditches		
Melanoplus lakinus Scudd.	0.02	0.27	0.30	0.27	--	0.09	--	24	0.16
M. mexicanus	15.04	61.23	60.57	37.47	37.10	26.99	22.35	5,975	39.55
M. occidentalis	.71	--	.17	.34	.08	--	--	42	.28
M. packardii	1.29	5.02	7.08	8.40	1.57	4.96	3.53	638	4.22
M. scudderii	--	--	--	--	--	--	.29	1	.01
Mermiria maculipennis macclungi	1.78	.02	--	4.54	--	.09	1.18	153	1.01
Mestobregma p. plattei	.29	.02	--	--	--	--	--	14	.09
Metator pardalinus	4.73	.40	.26	.75	--	.09	2.65	256	1.69
Opeia obscura	.27	--	--	--	--	--	--	12	.08
Orphulella pelidna	.02	--	--	--	--	--	--	1	.01
O. speciosa	2.51	--	--	--	--	--	--	113	.75
Pardalophora haldemani	.07	.02	--	--	--	--	--	4	.03
Phlibostroma quadrimaculatum	.87	--	--	--	--	--	--	39	.26
Phoetaliotes nebrascensis	.98	.05	--	.68	--	--	--	56	.37
Spharagemon collare	.02	.64	.90	.14	.31	--	--	57	.36
S. equale	1.15	1.48	1.20	.81	.39	.27	--	167	1.11
Trachyrhachis k. kiowa	3.59	.10	.04	--	.16	.62	.88	169	1.12
Trimerotropis laticincta	--	.02	--	.07	--	.09	--	3	.02
Nymphs	14.36	7.36	11.33	12.06	32.08	12.12	12.94	1,977	13.09
Total specimens per environment	4,507	4,046	2,331	1,476	1,275	1,130	340	15,105	--

SOUTH DAKOTA

The percentages of individuals of the various species present in South Dakota, arranged according to crops infested, are summarized as follows:

<u>Plains grassland</u>		<u>Percent</u>	<u>Small grain</u>		<u>Percent</u>
1.	<i>Ageneotettix deorum</i> -----	20	1.	<i>Melanoplus mexicanus</i> -----	61
2.	<i>Aulocara ellioti</i> -----	18	2.	<i>M. bivittatus</i> -----	7
3.	<i>Melanoplus mexicanus</i> -----	15	3.	<i>Aulocara ellioti</i> -----	6
4.	<i>M. packardii</i> -----	5	4.	<i>M. packardii</i> -----	5
5.	<i>Amphitornus coloradus</i> -----	5	5.	<i>Ageneotettix deorum</i> -----	3
6.	37 other species-----	37	6.	28 other species-----	18
	Nymphs - 14			Nymphs - 7	
<u>Idle land</u>			<u>Weedy roadside</u>		
1.	<i>Melanoplus mexicanus</i> -----	61	1.	<i>Melanoplus mexicanus</i> -----	37
2.	<i>M. bivittatus</i> -----	8	2.	<i>M. bivittatus</i> -----	13
3.	<i>M. packardii</i> -----	7	3.	<i>M. packardii</i> -----	8
4.	<i>Acolopius t. turnbullii</i> -----	3	4.	<i>Aulocara ellioti</i> -----	5
5.	<i>Ageneotettix deorum</i> -----	2	5.	<i>Mermiria maculipennis</i>	
6.	20 other species-----	19		<i>macclungi</i> -----	5
	Nymphs - 11		6.	23 other species-----	32
				Nymphs - 12	
<u>Legumes</u>			<u>Corn</u>		
1.	<i>Melanoplus mexicanus</i> -----	37	1.	<i>Melanoplus bivittatus</i> -----	31
2.	<i>M. bivittatus</i> -----	11	2.	<i>M. mexicanus</i> -----	27
3.	<i>M. femur-rubrum</i> -----	8	3.	<i>M. differentialis</i> -----	16
4.	<i>M. differentialis</i> -----	3	4.	<i>M. packardii</i> -----	5
5.	<i>Ageneotettix deorum</i> -----	3	5.	<i>M. femur-rubrum</i> -----	1
6.	13 other species-----	38	6.	19 other species-----	20
	Nymphs - 32			Nymphs - 12	
<u>Irrigation ditches</u>			<u>Grand total</u>		
1.	<i>Melanoplus bivittatus</i> -----	24	1.	<i>Melanoplus mexicanus</i> -----	40
2.	<i>M. mexicanus</i> -----	22	2.	<i>M. bivittatus</i> -----	9
3.	<i>Aulocara ellioti</i> -----	11	3.	<i>Aulocara ellioti</i> -----	8
4.	<i>M. femur-rubrum</i> -----	7	4.	<i>Ageneotettix deorum</i> -----	8
5.	<i>Hesperotettix speciosus</i> ----	4	5.	<i>M. packardii</i> -----	4
6.	13 other species-----	32	6.	42 other species-----	31
	Nymphs - 13			Nymphs - 13	

TEXAS

This is the second year in which collections were made in Texas during the adult survey. There were 1,235 specimens collected in 6 different environments in which 54 species were represented. Most of these collections were made outside of the Dissosteira longipennis area proper and, coupled with the difficulty in collecting this species where it was not numerous, it is not represented in its true relative numbers in the data recorded here. In the collections the dominant species by far was Melanoplus differentialis, at 27 percent of the total number collected. Chortophaga viridifasciata was second at 9 percent, and Syrbula admirabilis was third, at 8 percent. It should be noted that common species like Melanoplus mexicanus, M. femur-rubrum, and M. bivittatus, do not show up in nearly the relative numbers that they do in the more northern States.

Hatching began in the latter part of March and, as in other States, was retarded and prolonged throughout April and May by cold and rainy weather. D. longipennis began to hatch about May 5 in the Panhandle counties and all were adult about July 1. Heavy migrations of D. longipennis occurred and spread the infestation over all or parts of 16 counties. Egg deposition was heavy in spots and the outlook for next year is worse than it was for 1938.



TEXAS

Distribution by species of 1,285 specimens collected in Texas, expressed in percentage of total numbers collected in each habitat

Species	Bottom sand	Roadside	Grain	Sudan, corn, sorghum	Pasture	Cotton margins	Total speci- mens	Percentage of total
<i>Aeoloolus tumbullii bruneri</i>	--	1.01	3.07	--	--	--	5	0.38
<i>Ageneotettix deorum</i>	0.35	1.01	1.53	2.27	2.70	0.44	19	1.47
<i>Arphia simplex</i>	.35	--	--	4.54	1.62	--	15	1.16
<i>A. xanthoptera</i>	--	1.01	--	--	.27	--	2	.15
<i>Aulocara ellioti</i>	--	1.01	--	--	.54	--	3	.23
<i>Boopodon maculatum</i>	1.76	--	--	7.38	7.29	.44	46	3.57
<i>Brachystola magna</i>	.70	--	.76	5.11	.81	.44	16	1.24
<i>Campylacantha olivacea</i>	.70	3.03	--	--	1.08	--	9	.70
<i>Chorthippa viridifasciata</i>	10.91	1.01	40.00	5.11	4.05	5.30	120	9.33
<i>Dactylotum pictum</i>	--	2.02	--	--	.54	--	4	.31
<i>Dissosteira carolina</i>	--	--	--	--	--	1.32	3	.23
<i>D. longipennis</i>	--	5.05	2.30	12.50	3.51	1.76	47	3.65
<i>Drepanopterna femoratum</i>	--	--	--	--	.27	--	1	.07
<i>Encoptolophus p. subgracilis</i>	1.76	--	1.53	1.70	--	2.65	16	1.24
<i>E. sordidus costalis</i>	1.76	--	5.38	1.13	2.43	3.53	31	2.41
<i>Eadrotettix trifasciatus</i>	.35	2.02	1.53	--	5.67	1.76	30	2.33
<i>Hesperotettix speciosus</i>	3.87	--	1.53	1.13	1.35	1.32	23	1.78
<i>H. viridis</i>	.70	--	--	--	1.35	--	7	.54
<i>Hippiscus rugosus</i>	--	1.01	--	--	4.59	.88	20	1.55
<i>Lepus sp.</i>	--	--	--	--	.54	--	2	.15
<i>Melanoplus angustipennis impiger</i>	.35	--	1.53	--	.81	.44	7	.54
<i>M. arizonae</i>	--	5.05	.76	--	.27	--	7	.54
<i>M. bispinosus Scudd.</i>	.70	--	--	1.13	1.35	1.32	12	.93
<i>M. bivittatus</i>	--	7.07	--	--	--	--	7	.54
<i>M. differentialis</i>	35.21	35.35	10.76	34.09	7.29	49.11	347	27.00
<i>M. femur-rubrum</i>	2.46	1.01	--	--	1.89	1.32	18	1.40
<i>M. f. flavidus</i>	--	--	1.53	--	--	--	2	.15
<i>M. foedus foedus</i>	--	--	--	--	.54	--	2	.15
<i>M. foedus iselyi</i>	--	1.01	--	--	--	--	1	.07
<i>M. glaucipes</i>	--	--	--	--	1.08	--	4	.31

TEXAS (Continued)

Species	Bottom sand	Roadside	Grain	Sudan, corn, sorghum	Pasture	Cotton margins	Total specimens	Percentage of total
Melanoplus lakinus	--	11.11	--	--	1.35	--	16	1.24
M. mexicanus	--	--	6.92	--	--	0.88	11	.85
M. occidentalis	--	2.02	--	--	0.54	--	4	.31
M. packardii	--	5.05	1.53	1.13	4.32	1.76	29	2.25
M. ponderosus	1.05	--	--	--	1.08	1.32	10	.77
Mermiria maculipennis	2.45	6.06	7.69	4.54	8.91	3.53	72	5.60
Mestobregma p. plattei	--	--	--	--	.54	--	2	.15
Orphulella pelli	--	--	--	1.13	.81	--	5	.38
O. speciosa	4.22	1.01	--	--	3.51	1.32	29	2.25
Paraidemona mimica Scudd.	1.05	--	--	--	--	--	3	.23
Phlibostroma quadrimaculatum	--	--	--	--	.54	--	2	.15
Phoetaliotes nebrascensis	.35	--	--	--	--	--	1	.07
Schistocerca americana	.35	1.01	--	1.13	1.62	1.32	13	1.01
S. lineata	--	--	--	3.40	.54	--	8	.62
S. obscura F.	1.05	1.01	--	--	--	2.21	9	.70
Sparagemon bolli Scudd.	--	--	--	--	.27	--	1	.07
S. cristatum cristatum Scudd.	--	2.02	--	.56	1.35	--	8	.62
S. equale	--	--	--	--	1.08	.88	6	.46
Syrbula admirabilis	13.02	1.01	4.61	9.09	7.02	7.96	104	8.09
Trachyrhachis k. fuscifrons	3.87	--	--	--	7.02	1.32	40	3.11
Trimerotropis l. laticincta	--	--	.76	--	--	--	1	.07
T. pallidipennis	--	--	--	--	--	.44	1	.07
Tropidolophus formosus	.70	--	--	--	--	--	2	.15
Xanthippus c. pantherinus	--	1.01	.76	--	.54	--	4	.31
Undetermined	3.87	--	2.30	2.27	1.62	1.76	28	2.17
Nymphs	5.98	1.01	3.07	.56	5.40	3.09	50	3.89
Total specimens per environment	284	99	130	176	370	226	1,285	--

TEXAS

The percentages of individuals of the various species present in Texas, arranged according to crops infested, are summarized as follows:

<u>Bottom sand</u>		<u>Percent</u>	<u>Roadside</u>		<u>Percent</u>
1.	Melanoplus differentialis----	35	1.	Melanoplus differentialis----	35
2.	Syrbula admirabilis-----	13	2.	M. lakinus-----	11
3.	Chortophaga viridifasciata--	11	3.	M. bivittatus-----	7
4.	Orphulella speciosa-----	4	4.	Mermiria maculipennis-----	6
5.	Hesperotettix speciosus-----	4	5.	Melanoplus packardii-----	5
6.	Other species (20) and unident.	27	6.	Other species (20) and unident.	35
7.	Nymphs-----	6	7.	Nymphs-----	1

<u>Grain</u>			<u>Sudan, corn, sorghum</u>		
1.	Chortophaga viridifasciata---	40	1.	Melanoplus differentialis----	34
2.	Melanoplus differentialis----	11	2.	Dissosteira longipennis-----	12
3.	Mermiria maculipennis-----	8	3.	Syrbula admirabilis-----	9
4.	Melanoplus mexicanus-----	7	4.	Boopedon maculatum-----	7
5.	Encoptolophus sordidus costalis	5	5.	Brachystola magna-----	5
6.	Other species (14) and unident.	23	6.	Other species (13) and unident.	32
7.	Nymphs-----	3	7.	Nymphs-----	1

<u>Pasture</u>			<u>Cotton margins</u>		
1.	Mermiria maculipennis-----	9	1.	Melanoplus differentialis----	49
2.	M. differentialis-----	7	2.	Syrbula admirabilis-----	8
3.	Boopedon maculatum-----	7	3.	Chortophaga viridifasciata---	5
4.	Syrbula admirabilis-----	7	4.	Encoptolophus sordidus costalis	4
5.	Trachyrhachis k. fuscifrons--	7	5.	Mermiria maculipennis-----	4
6.	Other species (36) and unident.	57	6.	Other species (27) and unident.	27
7.	Nymphs-----	3	7.	Nymphs-----	3

<u>Summary</u>		<u>Percent</u>
1.	Melanoplus differentialis----	27
2.	Chortophaga viridifasciata---	9
3.	Syrbula admirabilis-----	8
4.	Mermiria maculipennis-----	6
5.	Dissosteira longipennis-----	4
6.	Other species (49) and unident.	42
7.	Nymphs-----	4



UTAH

This is the fourth consecutive year in which collections of grasshoppers were made in typical environments during the adult survey. There were 7,632 specimens collected in 10 environments and 38 species were represented in these collections. There was so little difference between the numbers of Melanoplus mexicanus and M. femur-rubrum that these 2 species could be considered as sharing first place in the economic importance of the different species. M. mexicanus was first in numbers in alfalfa, corn, idle land, and the total numbers of specimens collected. M. femur-rubrum was first in numbers in pasture, salt marsh, small grain, clover, miscellaneous margins, and miscellaneous crops. Opeia obscura and Trachyrachis kiowa were first in numbers on the range, according to the collections, although this statement is based on only 118 specimens. M. packardii was next in numbers in the total number of specimens collected. In the 1935 collections, M. mexicanus and M. femur-rubrum held about the same relative positions in numbers as in the 1938 collections. Then in 1936, M. femur-rubrum became more numerous than M. mexicanus, until in 1937 it was the dominant grasshopper in all environments, forming 69 percent of the total number of specimens collected. In the 1938 collections for Utah, M. femur-rubrum resumed about the same relative position with M. mexicanus as in 1935.

Hatching of grasshoppers began about the middle of April and was prolonged throughout June because of unfavorable weather conditions. The populations as a whole are down and control is confined mainly to irrigated fields and especially to seed alfalfa. Hoppers on adjacent range land give considerable trouble to the growers of seed alfalfa, especially when the range dries up. Relatively small numbers can destroy a great deal of seed and, therefore, a valuable crop.

Distribution by species of 7,632 specimens collected in Utah, expressed in percentage of total number collected in each habitat

Species	Al- falfa	Range	Pas- ture	Salt marsh	Mar- gin	Clo- ver	Small grain	Corn	Idle land	Misc.	Total spec.	Percentage of total
<i>Aeoloplus tenuipennis</i> Scudd.	0.11	--	0.10	--	--	--	--	--	--	--	5	0.07
<i>Ageneotettix deorum</i>	.21	1.69	--	--	0.68	--	--	2.57	--	1.03	24	.31
<i>Arphia pseudonietana</i>	.37	1.69	1.11	--	1.09	--	--	--	1.87	--	51	.66
<i>Aulocara eliotti</i>	.42	--	--	--	.41	--	0.50	1.71	2.57	1.03	38	.49
<i>Cannula pellucida</i>	.13	--	10.30	39.84	.68	--	7.75	.86	.23	--	199	2.59
<i>Chortippus curtippennis</i> Harr.	--	--	.20	--	--	--	--	--	--	--	2	.03
<i>Conozoa sulcifrons</i>	.03	2.54	--	--	.41	--	--	--	--	--	10	.13
<i>Derotmema haydenii</i>	--	.85	--	--	--	--	--	--	--	--	1	.01
<i>Dissosteira carolina</i>	.50	--	--	--	.88	1.00	5.75	.86	3.51	--	72	.94
<i>D. spurcata</i>	.11	--	--	--	--	--	1.00	--	.23	1.03	10	.13
<i>Drepanopterna femoratum</i>	.40	1.69	.40	--	--	--	.25	--	--	--	22	.29
<i>Hesperotettix viridis</i>	.03	8.47	.40	--	.75	--	--	--	--	--	26	.34
<i>Melanoplus angustipennis</i>	--	--	--	--	.07	--	--	--	--	--	1	.01
<i>M. bivittatus</i>	2.75	--	1.92	1.63	5.85	--	4.50	2.57	.47	1.03	235	3.06
<i>M. differentialis</i>	.34	--	--	--	--	24.00	--	--	--	26.78	63	.82
<i>M. femur-rubrum</i>	26.32	5.08	43.03	41.46	36.52	43.00	46.00	16.25	26.91	31.93	2,409	31.32
<i>M. keeleri luridus</i>	1.06	--	2.02	--	1.63	--	--	--	--	--	84	1.09
<i>M. lakinus</i>	--	--	--	--	.27	--	--	--	.23	--	5	.07
<i>M. mexicanus</i>	39.55	3.39	13.94	.81	34.54	31.00	15.00	47.03	46.33	18.54	2,511	32.64
<i>M. occidentalis</i>	.03	--	--	--	--	--	--	--	--	--	1	.01
<i>M. packardii</i>	9.48	3.39	1.62	.81	8.09	--	5.25	17.10	.70	3.09	546	7.10
<i>M. yarrowii</i> Thos.	--	.81	--	--	--	--	--	--	--	--	1	.01
<i>Mermiria maculipennis</i>	.37	10.16	.51	--	.20	--	--	.86	.23	1.03	37	.48
<i>Metator pardalinus</i>	.03	8.47	--	--	--	--	--	--	--	--	11	.14
<i>Opeia obscura</i>	--	14.40	1.21	--	.20	--	--	--	--	--	32	.42
<i>Oedaleonotus enigma</i>	--	--	--	--	--	--	--	--	--	3.09	3	.04
<i>Orphulella pelidna</i>	.08	.85	1.92	1.63	.34	--	.50	--	--	--	32	.42
<i>Phoetaliotes nebrascensis</i>	.34	--	--	--	.07	--	.25	--	--	--	15	.20
<i>Schistocerca shoshone</i>	.03	2.54	1.01	--	.07	--	--	1.71	.47	6.18	25	.33
<i>Spharagemon collaris</i>	.16	2.54	.10	--	.54	--	.25	1.71	2.81	1.03	34	.44

UTAH (Continued)

Species	Al- falfa	Range	Pas- ture	Salt marsh	Mar- gin	Clo- ver	Small grain	Corn	Idle land	Misc.	Total spec.	Percentage of total
Spharagemon equale	0.11	--	--	--	0.07	--	--	--	--	--	5	0.07
Trachyrhachis kiowa kiowa	.53	13.55	6.26	13.82	.88	--	0.50	0.86	0.47	--	133	1.73
Trimerotropis sparsa Thos.	--	.85	--	--	--	--	--	--	--	--	1	.01
T. melanoptera McN.	--	.85	--	--	--	--	--	--	--	--	1	.01
T. laticincta	--	--	--	--	--	--	--	--	1.40	--	6	.08
T. suffusus Scudd.	--	--	--	--	--	--	--	--	.70	--	3	.04
T. pallidipennis	.55	1.69	--	--	1.70	--	--	--	.94	--	52	.68
T. strenua McN.	--	8.47	--	--	--	--	--	--	--	--	12	.16
Nymphs	15.92	3.39	14.44	--	3.47	1.00	12.50	1.71	9.59	4.12	901	11.71
Undetermined	.08	2.54	--	--	.34	--	--	.86	.23	--	13	.17
Total specimens per environment	3,788	118	995	123	1,467	100	400	117	427	97	7,632	--



UTAH

The percentages of individuals of the various species present in Utah, arranged according to crops infested, are summarized as follows:

<u>Alfalfa</u>		<u>Percent</u>	<u>Pasture</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	39	1.	Melanoplus femur-rubrum-----	43
2.	M. femur-rubrum-----	26	2.	M. mexicanus-----	14
3.	M. packardii-----	9	3.	Camnula pellucida-----	10
4.	M. bivittatus-----	3	4.	Trachyrhachis k. kiowa-----	6
5.	M. keeleri luridus-----	1	5.	M. keeleri luridus-----	2
6.	21 other sp. and undet.--	6	6.	12 other sp.-----	11
7.	Nymphs-----	16	7.	Nymphs-----	14
<u>Range</u>			<u>Salt marsh</u>		
1.	Opeia obscura-----	14	1.	Melanoplus femur-rubrum-----	41
2.	Trachyrhachis k. kiowa----	14	2.	Camnula pellucida-----	39
3.	Memiria maculipennis-----	10	3.	Trachyrhachis k. kiowa-----	14
4.	Hesperotettix viridis-----	8	4.	M. bivittatus-----	2
5.	Metator pardalinus-----	8	5.	Orphulella pelidna deserata--	2
6.	16 other sp. and undet.--	43	6.	2 other sp.-----	2
7.	Nymphs-----	3			
<u>Margin</u>			<u>Small grain</u>		
1.	Melanoplus femur-rubrum--	37	1.	Melanoplus femur-rubrum-----	46
2.	M. mexicanus-----	35	2.	M. mexicanus-----	15
3.	M. packardii-----	8	3.	Camnula pellucida-----	8
4.	M. bivittatus-----	6	4.	Dissosteira carolina-----	6
5.	Trimerotropis pallidipennis	2	5.	M. packardii-----	5
6.	18 other sp.-----	9	6.	8 other sp.-----	8
7.	Nymphs-----	3	7.	Nymphs-----	12
<u>Clover</u>			<u>Corn</u>		
1.	Melanoplus femur-rebrum--	43	1.	Melanoplus mexicanus-----	47
2.	M. mexicanus-----	31	2.	M. packardii-----	17
3.	M. differentialis-----	24	3.	M. femur rubrum-----	16
4.	Dissosteira carolina-----	1	4.	M. bivittatus-----	3
5.	Nymphs-----	1	5.	Ageneotettix deorum-----	3
			6.	8 other sp. and undet.-----	11
			7.	Nymphs-----	3
<u>Idle land</u>			<u>Miscellaneous</u>		
1.	Melanoplus mexicanus-----	46	1.	Melanoplus femur-rubrum-----	32
2.	M. femur-rubrum-----	27	2.	M. differentialis-----	27
3.	Dissosteira carolina-----	4	3.	M. mexicanus-----	19
4.	Spharagemon collare-----	3	4.	Schistocerca shoshone-----	6
5.	Aulocara ellioti-----	2	5.	M. packardii-----	3
6.	12 other sp. and undet.--	8	6.	7 other sp.-----	9
7.	Nymphs-----	10	7.	Nymphs-----	4

<u>Grand total</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	33
2.	M. femur-rubrum-----	31
3.	M. packardii-----	7
4.	M. bivittatus-----	3
5.	Cannula pellucida-----	3
6.	33 other sp. & undet.----	11
7.	Nymphs-----	12

WISCONSIN

This is the fourth year in which collections have been made in Wisconsin during the adult survey. Collections were made in 1935, 1936, 1937, and 1938. In 1937 the number of specimens collected was only 242, and this was a meager representation. This past season 13,894 specimens were taken in 7 major environments in which 26 species were represented. Melanoplus femur-rubrum was by far the dominant species in all environments, and formed 60 percent of the total number of specimens collected. M. mexicanus was second in relative numbers, at 11 percent. M. femur-rubrum has held this position for the last 4 years. In 1933 and 1934 Camnula pellucida was most important, especially in the northern part of the State. No real comparisons can be made between 1937 and 1938 because of the vast difference in the numbers of specimens collected.

The hatching of M. mexicanus began during the third week of May in the light-sandy-soil area. Continued rains delayed and prolonged hatching all through June and reduced nymphal populations considerably. M. femur-rubrum was hatching in great numbers the first week of July and at the same time there were also adults in the same field. A great deal of bait was wasted in June because of rains, and most of the heavy baiting was done in July. The grasshopper potential in the 1938 survey is approximately one-half of what it was in the 1937 survey.



WISCONSIN

Distribution by species of 13,894 specimens collected in Wisconsin, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--						Total specimens	Percent- age of grand total
	Legumes	Pasture	Tame-hay meadow	Small grain	Idle land	Roadside	Corn	
Ageneotettix d. deorum	0.07	4.36	0.52	2.14	7.62	0.87	2.35	341 2.45
Arphia pseudonietana	.32	.56	1.31	.10	1.00	--	.39	73 .52
Arphia sulphurea	--	.03	--	--	.13	--	--	3 .02
Cannula pellucida	.41	1.75	1.18	.26	2.40	.17	--	144 1.04
Chortippus longicornis	.67	4.75	3.15	.73	.33	.69	1.18	282 2.03
Dissosteira carolina	.05	.05	--	.16	.20	--	.39	11 .08
Encyrtolophus sordidus	.05	.11	.07	.42	.20	--	--	18 .13
Hesperotettix viridis	--	--	.07	--	--	--	--	1 .01
Melanoplus angustipennis	.32	.96	.59	1.09	1.87	--	--	108 .78
M. bivittatus	.37	.21	.26	.31	.67	.17	.39	46 .33
M. confusus	--	--	--	--	--	--	.39	1 .01
M. dawsoni	.16	.32	.20	--	.94	--	--	36 .26
M. differentialis	--	--	--	--	.07	--	--	1 .01
M. femur-rubrum	63.48	59.60	49.60	66.09	47.16	76.26	70.98	8,362 60.12
M. f. flavidus	.05	.03	--	--	.20	--	--	6 .04
M. foedus fluvialis	.09	.08	--	--	--	--	--	7 .05
M. keeleri luridus	1.03	.88	.59	.89	.40	--	.39	111 .80
M. mexicanus	7.39	8.71	19.49	7.29	23.98	2.25	2.75	1,466 10.54
Orphulella pelidna	.02	.05	--	--	--	--	--	3 .02
O. speciosa	.02	.66	1.12	.05	.33	.17	--	50 .36
Phaenocarpa nebrascensis	.02	--	.13	.10	--	--	--	5 .04
Spharagemon collaris	.07	.16	.33	.36	.53	.69	--	33 .24
Schistocerca alutacea	--	.05	--	.10	.13	--	--	6 .04
Trachyrhachis kiowa fuscifrons	.02	.58	--	--	--	--	--	23 .17
T. kiowa kiowa	--	.08	--	.10	--	--	--	5 .04
Syrbula admirabilis	--	.03	--	--	--	--	--	1 .01
Nymphs	25.36	15.99	21.39	19.79	11.82	18.72	20.78	2,751 19.78
Total specimens per environment	4,356	3,765	1,524	1,920	1,497	577	255	13,894 --

# WISCONSIN

The percentages of individuals of the various species present in Wisconsin, arranged according to crops infested, are summarized as follows:

## Legumes

## Percent

1.	Melanoplus femur-rubrum-----	63
2.	M. mexicanus-----	7
3.	M. k. luridus-----	1
4.	Chortippus longicornis-----	1
5.	Cannula pellucida-----	1
6.	14 other species-----	27
	Nymphs - 25	

## Pasture

## Percent

1.	Melanoplus femur-rubrum-----	60
2.	M. mexicanus-----	9
3.	Chortippus longicornis-----	5
4.	Ageneotettix d. deorum-----	4
5.	Cannula pellucida-----	2
6.	17 other species-----	20
	Nymphs - 16	

## Tame-hay meadow

1.	Melanoplus femur-rubrum-----	50
2.	M. mexicanus-----	19
3.	Chortippus longicornis-----	3
4.	Arphia pseudonietana-----	1
5.	Cannula pellucida-----	1
6.	10 other species-----	26
	Nymphs - 21	

## Small grain

1.	Melanoplus femur-rubrum-----	66
2.	M. mexicanus-----	7
3.	Ageneotettix deorum-----	2
4.	M. angustipennis-----	1
5.	M. k. luridus-----	1
6.	11 other species-----	23
	Nymphs - 20	

## Idle land

1.	Melanoplus femur-rubrum-----	47
2.	M. mexicanus-----	24
3.	Ageneotettix d. deorum-----	8
4.	Cannula pellucida-----	2
5.	M. angustipennis-----	2
6.	13 other species-----	17
	Nymphs - 12	

## Roadside

1.	Melanoplus femur-rubrum-----	76
2.	M. mexicanus-----	2
3.	Ageneotettix deorum-----	1
4.	Chortippus longicornis-----	1
5.	Spharagenon collare-----	1
6.	3 other species-----	19
	Nymphs - 19	

## Corn

1.	Melanoplus femur-rubrum-----	71
2.	M. mexicanus-----	3
3.	Ageneotettix d. deorum-----	2
4.	Chortippus longicornis-----	1
5.	4 other species-----	23
	Nymphs - 21	

## Grand total

1.	Melanoplus femur-rubrum-----	60
2.	M. mexicanus-----	11
3.	Ageneotettix d. deorum-----	2
4.	Chortippus longicornis-----	2
5.	Cannula pellucida-----	1
6.	21 other species-----	24
	Nymphs - 20	

WYOMING

This is the fifth year in which collections were made in this State during the adult survey, the other 4 surveys having been made in the years 1934-37, inclusive. Wyoming is one of the 4 original States in which the project was started. Better and larger collections have been made here than in any other State. There were 35,703 specimens collected in 10 different environments, with 52 species represented. Melanoplus mexicanus was by far the dominant species in most environments and in the total number of specimens collected. It comprised over half the hoppers in small grain, corn, and idle land and made up 29 percent of those on the range land. M. femur-rubrum was second in numbers in most places and dominant in sugar beets and beans at 36 and 35 percent, respectively. Beginning in 1935, M. mexicanus has held about the same relative position as to its importance in crop land. Camula pellucida from second in numbers has fallen off to fifth place during this time. Aulocara ellioti and Ageneotettix deorum gave way to M. mexicanus on the range, because of the large flights of this latter species into eastern Montana in July and August. M. bivittatus remains in about the same relative position in 1938 as in other years.

There was a small hatch of M. bivittatus the third week of April and adverse weather conditions from then on retarded hatching and development and reduced populations. General hatching began during the first week of May. Adults of M. mexicanus and M. bivittatus began to appear between June 1 and 15. During the first part of July, major flights of M. mexicanus moved into all the eastern tier of counties from South Dakota. These flights cause major losses of crops and changed the local picture of 1939. There is little doubt that the grasshopper problem would have been reduced for 1939 if it had not been for these flights. Some heavy egg deposition took place in crop and idle land and a few adjacent areas of range land. Egg pod counts ran as high as 15 and 20 per square foot, with such averages as 4 per square foot for an entire county. This is equal to the egg counts made in the worst areas in South Dakota in the fall of 1937, where the major flights originated the summer of 1938. The extreme eastern counties present a distinct problem, not only from the standpoint of local crop protection but also from the standpoint of preventing a recurrence of major flights that might move into the irrigated sections of northern Colorado.



Distribution by species of 35,703 specimens collected in Wyoming, expressed in percentage of total number collected in each habitat

Species	Percentage collected in--							Total speci- mens	Percent- age of grand total			
	Legumes	Small grain	Range	Road- side	Meadow	Idle land	Corn			Mixed crops	Beets	Beans
Acrolophitus hirtipes	0.02	--	--	0.04	--	--	--	--	--	--	5	0.01
Aeoloplus turnbullii bruneri	--	--	--	.04	--	--	--	--	--	--	1	.01
A. turnbullii turnbullii	.29	0.44	4.59	1.91	0.16	1.54	--	--	4.31	0.78	408	1.14
Ageneotettix deorum	.45	1.10	12.33	1.37	5.28	2.31	4.40	--	--	--	954	2.67
Amphitornus coloradus	.07	.08	1.86	.62	.70	--	.31	0.34	--	--	145	.41
Arphia pseudonietana	.01	.02	.02	--	--	--	--	--	--	--	3	.01
Aulocara eliottii	1.16	2.42	11.71	1.46	6.53	1.15	4.24	1.03	.33	--	1,138	3.19
Bruneria brunnea	--	--	.08	--	--	--	--	--	--	--	4	.01
Camnula pellucida	3.00	5.23	1.51	.75	5.21	.48	1.10	--	.22	--	1,023	2.86
Chaloealtis conspersa	.01	--	--	--	--	--	--	--	--	--	1	.01
Chortippus longicornis	.10	.08	.09	.62	.93	--	--	--	--	1.04	58	.16
Cordillacris crenulata	--	--	1.39	.04	--	--	--	--	--	--	75	.21
Cordillacris o. occipitalis	.01	--	1.02	.37	--	--	--	--	--	--	64	.18
Cratypedes neglectus	.01	--	.04	--	--	--	--	--	--	--	3	.01
Derotmema haydenii	.03	.10	.23	.62	.08	.10	.31	.34	--	.26	45	.13
Dissosteira carolina	.17	.35	.06	.21	.08	.29	.94	1.71	.22	.78	82	.23
D. longipennis	--	.02	--	--	--	--	--	--	--	--	1	.01
Drepanopterna femoratus	.09	.08	2.05	.33	1.55	.48	.31	--	--	--	165	.46
Encoptolophus sordidus costalis	.02	.02	.06	--	1.09	--	--	--	--	--	21	.06
Hadrotettix trifasciatus	.07	.16	.34	.17	.23	.58	.16	--	.22	--	56	.16
Hesperotettix viridis	.05	.15	.38	.46	.08	.48	.47	--	--	--	57	.16
Hypochlora alba	.01	.02	.04	--	.16	--	--	--	--	--	7	.02
Melanoplus angustipennis	.73	3.09	2.09	4.62	.47	6.44	2.35	2.57	.22	1.30	647	1.81
M. bivittatus	9.36	6.55	1.75	7.29	9.40	1.25	3.14	1.03	12.72	11.72	2,572	7.20
M. b. bowditchi	.03	.10	.28	1.87	--	.96	--	.17	--	.52	85	.24
M. bowditchi canus Hebard	.03	.08	1.36	.21	.70	.77	1.57	--	--	--	115	.32
M. confusus	.01	.02	.02	--	--	--	--	--	--	--	4	.01
M. dawsoni	.10	.02	.17	--	.08	--	--	--	--	--	29	.08
M. differentialis	.28	.08	.13	.79	.08	.10	--	--	--	--	86	.24
M. femur-rubrum	23.25	11.99	3.84	15.49	22.07	4.32	14.91	.51	.65	.26	6,115	17.12

WYOMING (Continued)

Species	Percentage collected in--										Total speci- mens	Percent- age of grand total
	Legumes	Small grain	Range	Road- side	Meadow	Idle land	Corn	Mixed crops <sup>1</sup>	Beets	Beans		
Melanoplus foedus fluvialis--	0.01	--	--	--	--	--	--	--	--	0.26	2	0.01
M. foedus foedus--	.21	1.16	1.51	7.37	--	4.71	0.16	2.40	0.22	1.56	437	1.22
M. gladstoni--	.05	.43	.64	1.37	.23	.10	.16	--	--	--	106	.30
M. infantilis--	.07	.61	3.62	.92	.39	.38	2.35	.68	--	--	291	.81
M. keeleri luridus--	--	--	--	--	--	.48	--	--	--	--	5	.01
M. lakinus--	.01	--	--	.04	--	--	--	--	--	--	2	.01
M. mexicanus--	29.76	51.60	28.68	33.09	31.00	52.54	56.04	81.85	16.81	31.77	12,777	35.78
M. occidentalis--	.07	.10	.98	.29	--	.10	.31	1.03	--	--	87	.24
M. packardii--	2.72	1.33	3.09	3.25	1.09	11.34	1.73	2.74	1.08	5.73	987	2.76
Mermiria maculipennis--	--	1.89	.11	.12	.16	--	--	--	--	--	126	.35
Metator pardalinus--	.08	.18	1.64	.75	1.01	--	.31	.68	--	--	149	.42
Opeia obscura--	.02	.05	.96	.37	.39	--	--	--	--	--	71	.20
Orphulella pelidna--	.03	--	.04	--	.78	--	--	--	--	--	17	.05
Paropomala wyomingensis--	.01	--	.09	--	.08	--	--	--	--	--	7	.02
Phlibostroma quadrimaculatum--	.03	.07	5.59	.29	.47	.19	--	.68	--	--	325	.91
Phoetaliotes nebrascensis--	.04	.26	.72	.08	.85	.19	--	.51	--	--	79	.22
Spharagemon collare--	.19	.49	.49	1.00	.16	2.11	.47	.34	--	.26	144	.40
S. equale--	.03	.12	.41	.08	--	.58	.63	.51	--	--	50	.14
Trachyrhachis k. kiowa--	.03	.05	1.24	.17	.47	--	.16	--	--	--	85	.24
Trimerotropis gracilis--	--	--	--	.08	--	--	--	--	--	--	2	.01
T. laticincta--	.01	.05	.04	.12	--	.10	--	--	--	--	11	.03
T. p. pallidipennis--	.01	.03	--	--	--	--	--	.51	--	--	7	.02
Undetermined--	.08	.05	.13	.08	.23	--	.16	--	--	--	30	.08
Nymphs--	27.06	9.26	2.54	6.24	7.85	5.96	3.30	.34	26.94	8.33	5,937	16.62
Total specimens per environment--	17,520	6,076	5,308	2,402	1,287	1,041	637	584	464	384	35,703	--

<sup>1</sup> Sudan, cane, millet, and potatoes.

WYOMING

The percentages of individuals of the various species present in Wyoming, arranged according to crops infested, are summarized as follows:

<u>Legumes</u>		<u>Percent</u>	<u>Small grain</u>		<u>Percent</u>
1.	Melanoplus mexicanus-----	30	1.	Melanoplus mexicanus-----	52
2.	M. femur-rubrum-----	23	2.	M. femur-rubrum-----	12
3.	M. bivittatus-----	9	3.	M. bivittatus-----	7
4.	Camnula pellucida-----	3	4.	Camnula pellucida-----	5
5.	M. packardii-----	3	5.	M. angustipennis-----	3
6.	40 other species-----	32	6.	34 other species-----	21
	Nymphs - 27			Nymphs - 9	
<u>Range</u>			<u>Roadside</u>		
1.	Melanoplus mexicanus-----	29	1.	Melanoplus mexicanus-----	38
2.	Ageneotettix deorum-----	12	2.	M. femur-rubrum-----	15
3.	Aulocara ellioti-----	12	3.	M. foedus foedus-----	7
4.	Phlibostroma quadrimaculatum-	6	4.	M. bivittatus-----	7
5.	Aeoloplus turnbullii turnbullii	5	5.	M. angustipennis-----	5
6.	38 other species-----	36	6.	33 other species-----	28
	Nymphs - 3			Nymphs - 6	
<u>Meadow</u>			<u>Idle land</u>		
1.	Melanoplus mexicanus-----	31	1.	Melanoplus mexicanus-----	53
2.	M. femur-rubrum-----	22	2.	M. packardii-----	11
3.	M. bivittatus-----	9	3.	M. angustipennis-----	6
4.	Aulocara ellioti-----	7	4.	M. foedus foedus-----	5
5.	Ageneotettix deorum-----	5	5.	M. femur-rubrum-----	4
6.	27 other species-----	26	6.	22 other species-----	21
	Nymphs - 8			Nymphs - 6	
<u>Corn</u>			<u>Mixed crops</u>		
1.	Melanoplus mexicanus-----	56	1.	Melanoplus mexicanus-----	82
2.	M. femur-rubrum-----	15	2.	M. packardii-----	3
3.	Ageneotettix deorum-----	4	3.	M. angustipennis-----	3
4.	Aulocara ellioti-----	4	4.	M. foedus foedus-----	2
5.	M. bivittatus-----	3	5.	Dissosteira carolina-----	2
6.	18 other species-----	18	6.	14 other species-----	8
	Nymphs - 3			Nymphs - 0.34	
<u>Beets</u>			<u>Beans</u>		
1.	Melanoplus femur-rubrum-----	36	1.	Melanoplus femur-rubrum-----	35
2.	M. mexicanus-----	17	2.	M. mexicanus-----	32
3.	M. bivittatus-----	13	3.	M. bivittatus-----	12
4.	Aeoloplus t. turnbullii-----	4	4.	M. packardii-----	6
5.	M. packardii-----	1	5.	M. foedus foedus-----	2
6.	7 other species-----	29	6.	9 other species-----	13
	Nymphs - 27			Nymphs - 8	



WYOMING (Continued)

Percentage of grand total

1.	<i>Melanoplus mexicanus</i> -----	36
2.	<i>M. femur-rubrum</i> -----	17
3.	<i>M. bivittatus</i> -----	7
4.	<i>Aulocara ellioti</i> -----	3
5.	<i>Cannula pellucida</i> -----	3
6.	47 other species-----	34
	Nymphs - 17	

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THE INSECT PEST SURVEY  
BULLETIN

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Number 5

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BUREAU OF  
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THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING





# INSECT PEST SURVEY BULLETIN

Vol. 19

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## THE MORE IMPORTANT RECORDS FOR JUNE

Grasshoppers are rapidly reaching maturity over the entire infested area, except in central and northern North Dakota, where development has been somewhat delayed. A few heavy flights are occurring in Montana, although weather conditions at the end of the month were forcing the hoppers to the ground. Small local flights are occurring in the Red River Valley section of Minnesota, limited parts of western North Dakota, South Dakota, eastern Montana, Nebraska, Kansas, and Wyoming.

Adults of the Japanese beetle began to appear the first week of the month along the Atlantic seaboard from New Jersey to Norfolk, Va., and by the end of the month were very abundant.

The rose chafer is destructively abundant from Massachusetts westward to Indiana and Tennessee. Fruit and also flowers of all kinds have been injured considerably.

Blister beetles are very abundant in the Great Plains region from North Dakota to Texas, and also reported in Virginia, Indiana, Tennessee, and Mississippi.

Rather high infestation of the hessian fly in some early sown fields in northwestern Ohio and northeastern Indiana; infestation is under 10 percent in southern and central Ohio. Infestation is generally light and scattered in southwestern Missouri. Some commercial damage has occurred in the southeastern corner of Nebraska. In Kansas the infestations over most of the central and southern parts of the State average under 10 percent, and a few widely separated fields are highly infested.

Rains in Indiana and Illinois have greatly reduced the chinch bug infestations; however, in western Indiana some trouble is anticipated. In southern Iowa the insect is so abundant that serious damage is anticipated. It is quite destructive in north-central and northwestern Missouri, in southeastern Nebraska, and northeastern Kansas, and unusually numerous in south-central and southwestern Oklahoma.

The bugs are migrating from small grains to corn. Some cornfields in Oklahoma are being severely damaged.

A few reports of scattered local infestations of the armyworm were received from the Northeastern States and also from southeastern Missouri.

Codling moth larval entrances were first observed in the lower Hudson River Valley the first week in June and in the Lake region a week later. In the East Central States entrances were noted the first week in June in central Ohio, and in southern Indiana mature larvae were leaving the apples by June 8.

Fruit aphids are causing considerable injury in the Northeastern and East Central States.

The plum curculio is unusually abundant along the eastern coast from Massachusetts to Georgia, and also in the central part of the country from Indiana to Missouri.

The corn ear worm is causing the usual amount of injury to corn and tomato in the Southern States and more than usual damage in Missouri. Larvae are present in southern Illinois and eggs as far north as Urbana. Moths were beginning to appear on Long Island, N. Y., the last week of June.

An outbreak of the grape colaspis (Colaspis brunnea F.) is occurring in corn in the East Central States from Ohio and Kentucky westward through Missouri. In most instances the corn had followed sod where legumes had been turned under.

The grass thrips caused considerable injury to sweet corn in southeastern New York.

Flea beetles are active later than usual, injuring many kinds of vegetables.

The Mexican bean beetle is abundant as far north as Connecticut, New York, and northern Indiana.

The striped cucumber beetle is damaging squash and melons, as usual in the eastern half of the country.

The asparagus beetle seems to be causing more injury than usual along the Atlantic seaboard from Connecticut southward to South Carolina. It was also reported from Michigan and Washington.

The tobacco splitworm is showing up again in tobacco in Gadsden County, Fla.

In many sections of the Cotton Belt there has been plenty of rainfall during June and conditions have been very favorable for the rapid increase of the boll weevil. The present prospects are for as much damage this year as there was last year.

The forest tent caterpillar is still present in outbreak numbers in the Northern States, from Vermont and Connecticut to Pennsylvania, and from North Dakota to Washington.

#### THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA FOR MAY-JUNE

In the Prairie Provinces hatching of grasshoppers began the first week of May, was well under way by the middle of the month, and was practically complete by the first of June. The young grasshoppers caused some crop losses in certain areas, but their activities and development were being retarded by cool weather and timely rains, and an extensive poisoning campaign was producing good results. In the interior of British Columbia heavy June rains greatly retarded insect activity and, although grasshoppers were numerous in some areas, they were backward in development.

Infestations of the pale western cutworm were reported to be widespread in Saskatchewan, but up to mid-June little damage had been done where timely rainfall had brought about crop recovery, and elsewhere losses were relatively light.

A severe outbreak of the red-backed cutworm developed in the Peace River district of Alberta, from the Grande Prairie and Spirit River districts west to near the interprovincial boundary. An estimated loss of 20 percent of grain crops had already occurred by June 16. In other parts of the Peace River areas of Alberta and British Columbia the infestation was lighter and more scattered. Severe infestations were noted in several districts around Edmonton.

Serious damage to grain crops by wireworms was reported widespread in the three Prairie Provinces. In Manitoba an average of 25 percent damage on summer fallow wheatfields was recorded in the Coulter-Waskada district. In Saskatchewan the damage to wheat seeded on fallow was estimated at 20 percent for the Saskatoon to Dafoe area.



and 10-15 percent for the Dafoe-Buchanan district. The Peace River district of Alberta was also affected, and crop losses occurred locally in southwestern Ontario and the interior of British Columbia.

Reports of injury to vegetable crops by flea beetles have been received from Quebec, Manitoba, Saskatchewan, and British Columbia. The species Phyllotreta albionica Lec. destroyed many young cruciferous plants on Vancouver Island and on the mainland of British Columbia.

Heavy flights of the rose chafer occurred locally in light sandy areas in southern Ontario. Damage to crops was expected to be negligible.

The sweetclover weevil (Sitona cylindricollis F.) has been found to be widely distributed in Manitoba and has caused severe damage to sweetclover in many localities. It had not been previously recorded west of the Georgian Bay region of Ontario.

Moderate flights of the beet webworm during the latter part of May and early in June were reported from several localities in Manitoba and Saskatchewan. A fairly general flight occurred over most of southern Alberta.

Untreated cabbage plants in southwestern Ontario have suffered severely from attacks of the cabbage maggot.

The apple grain aphid was unusually abundant in apple orchards of Nova Scotia and southern Ontario, and the rosy apple aphid also appeared in injurious numbers in some sections of these two regions. However, apparently neither species proved to be a serious pest.

Injury to fruit buds by the tarnished plant bug was prevalent this spring in orchards of the Okanagan Valley, British Columbia.

The oriental fruit moth infestation on peach in the Niagara district, Ontario, is reported as low.

## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

General. W. E. Dove (June 3): First adults of migratory grasshopper Melanoplus mexicanus Sauss. reported late last week from western South Dakota, Nebraska, and eastern Wyoming. Principal infestations of migratory range grasshopper (Dissosteira longipennis Thos.) local in the Panhandles of Oklahoma and Texas, and in northeastern New Mexico, eastern Colorado, and southwestern Kansas, where extremely heavy numbers hatched this spring. Other areas of these States rather lightly infested, with the exception of Colorado, where severe infestations of crop lands occur. Hatching throughout this area practically complete. (June 12): Adults of M. mexicanus becoming common in the northwestern Great Plains States. Good control being obtained. Heavy infestations remain in brushy river bottoms and bad lands, where control operations are difficult. In the Southwestern States approximately 10 percent of D. longipennis have reached the adult stage in the southern part of the infested area of New Mexico, and about 5 percent in Texas. (June 20): Adults of M. mexicanus appearing in considerable numbers throughout most of the infested area of the northwestern Great Plains States, except in central and eastern North Dakota, where hatch is not complete and development somewhat behind that of the rest of the area. Percentage of adults about 75 percent in Colorado and southwestern Kansas; from 20 to 50 percent in Nebraska; from 20 to 40 percent in South Dakota; about 10 percent in eastern Montana, with the greater number rapidly becoming adults; less than 10 percent in western North Dakota; and about 5 percent in the Red River Valley of Minnesota. Mating observed in all infested States south of and including Wyoming and South Dakota. Heavy flight of M. mexicanus reported in Baca County, Colo., where adults from the north flow into crops. Small local flights observed in Kansas and Nebraska. Observed in flight high in the air in an area 20 miles north of Miles City, Mont. Flights in this area apparently inevitable, as there is an infestation of 4,225 square miles extending from 16 miles north of Miles City northward to the Musselshell River. Entire district uniformly infested at rate of 50 per square yard. All green vegetation gone in many places and sage brush 50-percent destroyed. No noticeable effect by rain in reducing populations in the northwestern Great Plains States. Hoppers apparently in a weakened condition in some localities, but very few dead nymphs found. Flesh fly parasites Sarcophaga kellyi Ald. appeared about 3 weeks earlier this year. Parasitization reported as 10 percent in southwestern North Dakota, and in three southeastern Nebraska counties, with some spotted activity in eastern Montana. D. longipennis in the Southwestern States is rapidly reaching the adult stage in the southern parts of the infested area. About 80 percent are adults in the southern part of the infested counties of northwestern New Mexico, about 25 percent in the southern counties of the Texas Panhandle, and from 2 to 5 percent in the more northern parts of the Texas Panhandle, Colorado, and the Oklahoma Panhandle.

(June 27): Possible flight threats from M. mexicanus recently reported in Montana not extensive, as weather conditions have forced the hoppers to the ground. Most of remaining populations now reaching the adult stage and flight anticipated if weather conditions are favorable. Very serious problem found in northern Custer, Roosevelt, western Prairie, and southern Garfield Counties, Mont., as crops and range in that area have been almost completely destroyed and minor flights are originating in some sections. High populations of M. mexicanus and D. longipennis recently observed south of the Missouri River in South Dakota. Control operations started.

Indiana. J. J. Davis (June 21): Young grasshoppers observed as abundant in clover and waste land. Expected to be abundant in some parts of the State but perhaps not a severe general outbreak. Reported on June 11 as damaging flowers in Howard County.

Illinois. W. P. Flint (June 20): Reduced by heavy rains, which have favored growth of vegetation, further tending to lessen damage.

Minnesota. A. G. Ruggles and assistants (June 19): Infestations scattered over the State; more in the western counties than in the eastern. Heavily infested counties as follows: Anoka, Becker, Beltrami, Carlton, Clay, Dakota, east Otter Tail, Kittson, Koochiching, Lac qui Parle, Morrison, Mahanomen, Pine, Pipestone, Red Lake, Rock, Wadena, Wilkin, and Yellow Medicine. Chortophaga viridifasciata Deg. reported from McIntosh on May 5, when third-instar nymphs moderately abundant. Reported from Anoka on May 15, where the pink form was moderately abundant. Two-striped grasshopper, M. bivittatus Say, very abundant at Hallock, Kittson County, on June 14.

Iowa. H. E. Jaques (June): Heavy infestation throughout western Iowa, becoming lighter in the central counties. Scattered light infestations in extreme southeastern Iowa.

Missouri. L. Haseman (June 24): Adults of M. bivittatus began appearing in central and northern Missouri around the middle of June. M. mexicanus ready to oviposit in central Missouri. M. differentialis Thos. still immature and less abundant than the other two species. Heaviest infestation again centers in a dozen north-central counties.

North Dakota. J. A. Munro (June 22): Unusually heavy infestations, with M. mexicanus predominating, observed in brush or wooded areas along rivers and streams. Control difficult. Control work going on mainly in the Red River Valley and western counties, where infestations are most serious.

South Dakota. H. C. Severin (June 5): M. confusus Scudd. has increased in abundance during the last few years until it has become very injurious all over the State.



Nebraska. O. S. Bare (June 20): Infestations in the State extremely variable. Heaviest in western Nebraska in many years, but a number of counties in the southeastern quarter of the State lightly infested. Infestations throughout the rest of the State spotted, often being extremely heavy in one locality, while in localities but a few miles away only a few can be found. Infestations generally average; no heavier than those of 1936, 1937, and 1938. Control work procuring good results. Rather severe damage in some counties but on the whole damage less than in 1937 and 1938.

M. H. Swonk (June 20): Phenomenally heavy flights of Pardalophora haldemani Scudd. in Redwillow County between McCook and Indianola on the night of June 6, and in southeastern Custer, Sherman, and Howard Counties on the night of June 16. Reports on flight of June 6 indicate it as very heavy.

Oklahoma. C. F. Stiles (June 21): D. longipennis and M. mexicanus the most prevalent grasshoppers throughout the Oklahoma Panhandle are appearing in larger numbers than anticipated from the egg survey. Being brought under control in most areas. Problem not serious in the rest of the State, with the exception of Stephens and Jefferson Counties, where M. bivittatus and M. differentialis are quite numerous and damaging cotton.

Washington. D. D. Jackson (June 6): In the Spokane Valley, around Opportunity, hoppers were hatching in great numbers in alfalfa. On May 26 they were in the first through the fourth instars.

L. G. Smith (June 6): Cannula pellucida Scudd. in the first to third instars observed 2 miles southwest of Pullman on June 2, congregated in their hatching beds and numbering from 800 to 1,000 per square yard, spotting an area of 5 acres.

MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. J. A. Munro (June 22): Light infestations reported in western Cass and La Moure Counties. No reports of crop damage.

Wyoming. Twin Falls Daily News (May 14): The mile-long tin and wood fence with which residents of Sundance, Crook County, northeastern Wyoming, have fought millions of Mormon crickets for 2 years, being prepared to repulse what may be an even more severe attack this year.

Idaho. Boise Statesman (May 14): Crickets invading the area of Boise. (May 18): Madison County fighting off an invasion for the first time in 20 years. Fremont County to the north, long infested, launching extensive control operations.

Nevada. E. Records (June 3): Mormon cricket eggs collected near Winnemucca submitted for examination on April 19. Unexamined eggs set aside in moist sand, and on May 8 an insect was noted in the dish with the eggs. (Det. by C. F. W. Muesbeck.)

Oregon. Salt Lake Tribune (May 14): Now infesting six townships in eastern part of Baker County. Swarming off forest reserve and public domain on 35,000 acres of rich crop land in Pine and Eagle Valleys.

California. S. Lockwood (June 19): A very scattered infestation occurred in Lassen County, Calif., 18 or 19 miles northwest of Reno, Nev., on the California-Nevada line. Infestations consist, so far as known, of very widely scattered individuals, difficult to find in the vegetation of the area. Infested area, so far as determined at a survey, not more than 5 square miles, and, in many places in that area, crickets found only occasionally. In no instance found in numbers.

#### WHITE GRUBS (Phyllophaga spp.)

Massachusetts. W. B. Becker (June 27): Adults partially defoliated an ash tree near a street light during the nights late in May.

Oklahoma. F. A. Fenton (June 20): Adults of the wheat white grub P. lanceolata Say, reported as damaging cotton near Walters, Cotton County, and as defoliating shelterbelt trees, chiefly elms, near Watonga, Blaine County, and in a nursery in Oklahoma City, Oklahoma County.

#### JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. J. P. Johnson (June): Reports of damage, and increase of requests for information on control in lawns, indicate that damage caused by the grubs is increasing yearly. Most of the reports from southwestern Connecticut.

New Jersey. E. Kostal (June 16): First beetle found today at Morganville, Monmouth County.

Pennsylvania. T. L. Guyton (June 6): Larvae found in lawn grass at Hudson, near Wilkes-Barre, in an abundance of 15 to 20 per square foot.

Delaware. L. A. Stearns (June): Adults first observed week beginning June 19 at Newark.

Maryland. E. N. Cory (June 24): First beetles taken at College Park on June 12. Early reports, unaccompanied by specimens, received from Eastern Shore. Four beetles taken from a potato field near Pocomoke on June 16.

H. L. Dozier (June 12): Beetles issued in abundance on June 11 at Cambridge, following first heavy rain in weeks.

H. C. Donohoe (June 21): A single beetle found on June 6 near Princess Anne. Date doubtless marks the approximate start of beetle emergence in this locality since the first beetle in 1938 was found on June 5 in the same spot.

Virginia. H. G. Walker and L. D. Anderson (June 26): Apparently much more abundant at Norfolk and in the two counties on the Eastern Shore than ever before. At Norfolk 117 beetles were collected in 24 traps, as compared with 35 for the same period last year.

H. C. Donohoe (June 21): Beetles out in small numbers at Cape Charles on June 7 and reported observed by residents for about 1 week before that. By June 20 the infestation in the Cape Charles area was severe, with much damage to grapes and ornamental shrubbery.

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

Connecticut. J. P. Johnson (June): Grubs have damaged many lawns this spring at New Haven and West Haven. Withdrought throughout May, combined with grub injury, lawns were severely damaged. Recorded as more prevalent in West Haven and in new sections of New Haven.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. J. P. Johnson (June): Numerous reports of injury to turf lawns received from New Haven throughout May and June.

New York. N. Y. State Coll. Agr. News Letter (June 5): Light flight of beetles on June 3 in Nassau County, eastern New York.

Pennsylvania. C. H. Hadley (May): In surveys made on May 29 at Jenkintown found quite generally distributed. Of individuals recovered approximately 24 percent in the prepupal stage, with the rest in third instar.

District of Columbia. Mary B. Cox (June 21): Specimens found in ground near surface, and on surface of lawn in northwestern section of Washington. (Det. by E. A. Chapin.)

ROSE CHAFER (Macrodactylus subspinosus F.)

Connecticut. M. P. Zappe (June 19): Adults very abundant in New Haven and Middlesex Counties. Injuring young peaches and Siberian elms severely, also injuring grape blossoms.

Massachusetts. A. I. Bourne (June 26): First noted on June 13, when they were found feeding on corn. Reported since then as abundant throughout the State, and besides damage to the usual plants, such as roses and grapes, reported as feeding on foliage of fruit trees.

New York. N. Y. State Coll. Agr. News Letter (June): Observed in great abundance in both eastern and western New York the middle of June, causing considerable injury by attacking peach, apple, pear, cherry, grape, and other trees and shrubs.

R. E. Horsey (June 17): Reported as common on roses in sandy soil. Observed on peony blossoms at Rochester from June 10 to 17.



Maryland. E. N. Cory (June 24): Observed in usual abundance on flowers.

Ohio. T. H. Parks (June 21): Injurious on fruit trees and flowers near Toledo.

Indiana. J. J. Davis (June 21): Very abundant in parts of northern Indiana, attacking rose, peony, iris, and other flowers, also foliage of fruit trees and Chinese elm. First reports received on June 5.

Tennessee. G. M. Bentley (June 20): Noticed in unusual numbers on May 26 on apples at McMinnville, Warren County.

#### WIREWORMS (Elateridae)

Maine. J. Hawkins (June 14): Both adults and larvae of the wheat wireworm (Agriotes mancus Say) present in a field where potatoes were grown last year at Benedicta. Oats and wheat not seriously affected but seed pieces of potato planted in infested soil were injured.

Delaware. L. A. Stearns (June 20): Several acres of corn on bottom land along a creek between Greenboro and Solbyville destroyed.

Kentucky. W. A. Price (June 23): Approximately 50 percent of the tobacco in the vicinity of Lexington injured. Most common species was Acolus dorsalis Say. A small percentage of injury caused by larvae of Monocrepidius auritus Hbst.

North Dakota. J. A. Munro (June 22): Prairie grain wireworms, Ludius acreipennis Kby., ranged from slightly over 2 per seed piece to few or none in potato fields along the edge of the Red River Valley area, from Edinburg to Walhalla. In one field near Walhalla Melanotus spp. predominated, with larvae present in about one-third of the potato seed pieces.

Arizona. O. L. Barnes (June 13): Present and causing some damage to young corn plants near Flagstaff on June 7-8.

California. M. W. Stone (June 19): A 10-acre field of tomatoes near Buena Park so damaged by Limonius californicus Mann. that over 19 percent of original stand was replanted and replants also being damaged at time of examination. Counts made in 12 hills of potatoes in a 15-acre field near Artesia showed over 50 percent of the tubers with 1 or more worm holes.

#### BLISTER BEETLES (Meloidae)

Virginia. A. M. Woodside (June 17): Gardens in Augusta County damaged severely by a blister beetle.

Indiana. J. J. Davis (June 21): Macrobasis unicolor Kby. reported as defoliating alfalfa in Greene County on June 15.

Tennessee. G. M. Bentley (June 20): Striped blister beetle (Epicauta marginata F.) reported as destroying tomato plants at Memphis, Shelby County.

Mississippi. C. Lyle (June 24): Adults of Epicauta lemniscata F. received from Quitman County on June 8; reported as feeding on alfalfa. Blister beetle injury to tomatoes reported from Oktibbeha County.

Texas. R. K. Fletcher (June 22): E. lemniscata reported in Washington County on May 23 on "cow beets."

North Dakota. J. A. Munro (June 22): Very abundant and injurious to caragana and other legumes. On June 17 at Mandan caragana, honeylocust, and lilac defoliated by beetles. Also causing serious damage at Enderlin, Oakes, and Fargo.

South Dakota. H. C. Severin (June 5): A number of different species doing much damage to caragana, garden plants, sweet clover, and alfalfa over practically the entire State.

Nebraska. M. H. Swenk (June 20): Segmented blister beetle (Macrobasis segmentata Say) found damaging potato plants in Butler County on June 17. One-colored blister beetle (M. unicolor) found attacking garden crops in Furnas County on May 26.

D. B. Whelan (June 20): M. unicolor, E. maculata Say, and E. ferruginea Say, in the order named, numerous in alfalfa fields in eastern Nebraska during June.

Arizona. W. A. Stevenson (June 17): Very heavy population noted in two fields of alfalfa at Sahuarita, Pima County.

Utah. G. F. Knowlton (June 13): On June 3 ashy-gray blister beetles very abundant on and seriously damaging alfalfa at Emery, Emery County, southeast of central Utah. Also abundant on alfalfa at Nibloy and Corinne, Box Elder County. Found damaging alfalfa and beets in some fields in Utah County.

#### CURWORMS (Noctuidae)

Georgia. P. M. Gilmer, P. A. Glick, and R. T. Harwell (June 3): Climbing cutworms very prevalent in all fields in Dooly, Berrien, Tift, Cook, Lowndes, and Echols Counties, causing serious loss of stand on cotton and peanuts, especially on fields planted last season in crops having rank growth.

P. M. Gilmer (June 12): Damage in isolated cases very severe, and, throughout the southern section, much more severe than usual. Some cotton fields reduced in stand fully 15 to 25 percent, and one Sea Island field near Alapaha has lost fully 40 percent. Very serious damage on peanuts reported a number of times, and in one case so severe only about 12 plants were left standing on about 5 acres of a 12-acre field. Practically every stub plant in the

peanut field showed from 3 to 8 large larvae at the roots.

Nebraska. M. H. Swenk (June 20): Complaint received of annoyance by moths Chorizagrotis auxiliaris Grote around windows of a house in Sheridan County on June 15.

Arizona. O. L. Barnes (June 13): While making a grasshopper survey about 10 miles northeast of Flagstaff, on June 7-8 cutworms were damaging young corn in all fields examined. It was estimated that in one 20-acre field 40 percent of the plants were destroyed, and intermediate and late-instar larvae continued to feed on remaining plants. Damage almost 100 percent in strips several yards wide, adjacent to field margins and small grains. Damage beginning in fields of pinto beans examined both in this area and in nearby Doney Park. Also causing injury in some vegetable gardens. In fields where bean plants had reached a height of 2 or more inches damage was 5 to 10 percent. (Larval specimens determined as probably Euxoa sp. by C. Heinrich.)

Utah. G. F. Knowlton and F. C. Harmston (May 31): Causing serious injury to crops at Callao, Juab County.

Washington. A. E. Lovett (June 6): Porosagrotis sp. extensively damaging strawberries at Bellevue and Kirkland, King County, on May 31. In many instances from three to five worms reported as found at one hill. (Det. by C. Heinrich.)

BEET WEBWORM (Loxostege sticticalis L.)

Nebraska. M. H. Swenk (June 20): Moths were flying in great abundance during the first week in June in western Nebraska. Particularly numerous in southern Garden and Deuel Counties; also very plentiful in Cheyenne, Morrill, Scotts Bluff, Box Butte, Keith, and Lincoln Counties. First reports of webworms from Box Butte County on June 12 and from Antelope County on June 15.

Utah. G. F. Knowlton (June 15): Larvae are damaging many fields of beets and in some fields are attacking alfalfa and peas in Utah and Davis Counties. Serious injury in some fields. Larvae leaving weeds are injuring various crops and plants.

WHITE-LINED SPHINX (Sphinx lineata F.)

Utah. G. F. Knowlton and F. C. Harmston (June 8): Larvae of two-lined sphinx abundant on range land near farms north of Brigham City, Box Elder County.

G. F. Knowlton (June 15): Larvae damaging grape foliage at Pleasant View, northern Utah.



WEBWORMS (Crambus spp.)

Pennsylvania. H. E. Hodgkiss (June 22): A few adults of sod webworms observed on May 25; most ready to pupate. Some continue to feed in turf in southeastern counties. Infestation on field corn in Perry County moderate; larvae of various sizes. On June 22 larvae were causing severe damage in Centre County.

Delaware. L. A. Stearns (June): Serious damage to corn investigated in the vicinity of Smyrna during the week beginning June 5. Injury sufficient to necessitate replanting.

SPITTLEBUGS (Cercopidae)

New York. N. Y. State Coll. Agr. News Letter (June 19): Numerous in celery and found feeding on set onions in Orange County, eastern New York. (June 26): Adults observed as having migrated in large numbers from a hayfield to corn in Ulster County, eastern New York. In Oswego and Jefferson Counties, western New York, adults observed in numbers on alfalfa during the last week. Now in the adult stage.

Pennsylvania. H. E. Hodgkiss (June 22): Abundant throughout the State on June 15; adults numerous on June 19.

Delaware. L. A. Stearns (June): Generally abundant early in June throughout Newcastle County on clover, alfalfa, and various weeds.

West Virginia. L. M. Peairs (June 2): Several reports of damage to clover and alfalfa by Philaenus leucophthalmus L. Specimens sent from Green Spring. (Det. by P. W. Oman.)

Tennessee. G. M. Bentley (June 20): More reports received and specimens noted than ever before. Reported from different parts of the State on various small-leaved evergreens. No injury observed.

Maryland. E. N. Cory (June 13): A very general infestation of Aphrophora parallela Say on clover and alfalfa.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (June 21): Rather high infestations now present in some early sown fields of the northwestern part of the State. Wheat-insect survey, now under way, shows infestations less than 10 percent in southern and central counties.

Indiana. C. Benton (June 19): Pupation of spring brood practically completed near La Fayette by June 12. Several rather heavily infested fields observed or reported from Tippecanoe and adjacent counties. Several damaged fields reported from the heavily infested area of northeastern part of the State. Infestation due to rather general early seeding of wheat during the last 2 years, in order to escape black stem rust infestation, which severely injured late-sown wheat in 1937.

J. J. Davis (June 21): Apparently unusually abundant and destructive in northeastern Indiana.

Iowa. H. E. Jaques (June): Infestation in southeastern section of Louisa County.

Missouri. E. T. Jones (June 12): Appears to be generally light and scattered in southwest. Some second-spring-generation larvae present on young wheat at Springfield, but not very abundant.

Nebraska. M. H. Swenk (June 20): Has done commercial damage to wheat in some localities along the southern border of the State west to Jefferson County, and along the Missouri River north to Burt County, owing mostly to an increase in very late-sown wheat by the supplementary fall brood of 1938, carried still farther by the 1939 spring brood. A field in Burt County on June 14 showed an average of 0.83 puparium per stem, including both the supplementary fall brood of 1938 and the spring brood of 1939.

Kansas. E. T. Jones (June 12): Examination of spring stubble from 32 fields distributed over central and southern parts of the State show puparia of hessian fly present in most fields. Although infestations generally average under 10 percent of tillers, a few widely scattered fields show high infestations. Only occasional late fields show presence of second-spring-generation larvae.

CHINCH BUG (Blissus leucopterus Say)

Indiana. J. J. Davis (June 21): Apparently there will be more trouble than was anticipated from this pest in western Indiana, from Lake County on the north to Knox County on the south. Bugs more immature than usual, in comparison with the development of small grain.

C. Benton (June 19): First-instar nymphs first observed on May 23 in a field near La Fayette. Parts of a number of winter wheatfields and ryefields in Tippecanoe, Benton, and adjacent counties show from light to moderately severe infestations of young bugs, which may menace adjacent corn. Some reduction in numbers of young bugs by hard rains the first part of June but not enough to reduce them materially. Some bugs reached the fourth instar on June 12, most of them being in the first three instars.

Illinois. W. P. Flint (June 20): Heavy showers occurring during the first part of June have covered almost the entire State. Young chinch bugs are so reduced in numbers that no serious infestation will occur.

Iowa. W. E. Dove (June 5): Unless the situation changes a great deal within the next 2 weeks the chinch bug problem will be pretty serious in the State. Situation believed to be more serious than in 1933 but not quite as serious as in 1934. Chinch bugs have just started to hatch. Rains of the last few days have not materially changed the situation. Conditions were a little too dry for them and the drought probably affected the population more than did the rains.

H. E. Jaques (June): Practically the entire southern portion of the State infested.

Missouri. L. Haseman (June 24): Throughout the north-central and north-western parts of the State bugs are leaving wheat in destructive numbers on scattered farms. Not appearing as a general epidemic but doing much damage where abundant. Barriers used since the middle of June.

Kansas. H. R. Bryson (June 24): Giving more trouble in Kansas this year, owing to an extension of the barley-growing area in eastern Kansas. Reports of injury received from St. Marys, Onaga, Morrill, Garnett, Howard, and southeastern counties.

Nebraska. M. H. Swenk (June 20): Began their migration out of the small-grain fields on June 15, and migration still in progress. All counties concerned are in the extreme southeastern part of the State and include Richardson, Pawnee, southern Gage, Nemaha, eastern Otoe, eastern Cass, Douglas, and, less heavily, Saunders. In the Missouri River counties above mentioned, barley fields extensively destroyed by the bugs, and barriers under construction for the last few days.

Oklahoma. C. F. Stiles (June 21): Unusually numerous through the south-central part of the State this season. More barley than usual planted last season and inexperienced farmers planted corn alongside the barley. Some cornfields have suffered 50-percent damage by migrating bugs.



R. G. Dahms (June 18): Causing severe damage in many corn and sorghum fields in southwestern part of the State. Much of the sorghum in this section was planted late and in some fields plants were killed within 3 or 4 days after they came up. About 95 percent of the first-generation bugs have reached the adult stage. First eggs from first-generation bugs found on June 13.

Texas. R. K. Fletcher (June 22): Ruined a stand of sorghum at College Station, observed on June 6.

ENGLISH GRAIN APHID (Macrosiphum granarium Kby.)

Nebraska. D. B. Whelan (June 6): More numerous on wheat near Lincoln than last year, but not serious.

PACIFIC GRASS BUG (Thyrillus pacificus Uhl.)

Washington. R. D. Eichmann (May 30): On May 23 observed apparently moving into wheat as native grasses dry up at Prescott, Walla Walla County. A general feeder and usually of slight economic importance.

G. Edward (June 6): Reported as attacking winter wheat 8 miles northeast of Dayton, Columbia County.

WHEAT JOINTWORM (Harmolita tritici Fitch)

Ohio. T. H. Parks (June 21): Has increased greatly since last year and is quite abundant in some wheat in central part of the State. This insect, formerly a major pest of wheat here, has been very scarce for 20 years.

WHEAT STRAW WORM (Harmolita grandis Riley)

Nebraska. M. H. Swenk (June 20): Seriously infesting wheat in an area in south-central section this spring. On June 12 found infesting wheat plants as far north as Merrick County.

ARMYWORM (Cirphis unipuncta Haw.)

Connecticut. N. Turner (June 19): Twelve acres of corn heavily damaged on June 15, the larvae marching in on June 14. One acre of sweet corn in New Milford lightly infested on June 9. Another infestation reported in North Haven.

New York. N. Y. State Coll. Agr. News Letter (June 26): Outbreak just reported by J. S. Clark, Caumsett, Huntington, Long Island.

New Jersey. C. A. Clark (June 3): Armyworms, after destroying about 10 acres of timothy, migrated to adjacent young corn at Moorestown, and completely destroyed 5 acres of sweet corn about 8 inches high.

Delaware. L. A. Stearns (June 12): Single outbreak in vicinity of Hockessin, New Castle County, reported and observed during week commencing June 12.

Missouri. L. Haseman (June 24): Doing considerable damage on some farms in southeastern section during the month. Only an occasional specimen collected in central part of the State.

SORGHUM WEBWORM (Celama sorghiella Riley)

Kentucky. W. A. Price (June 23): On rye heads received from Owensboro, accompanied by statement that they had destroyed much of the grain in a 15-acre field.

CORN

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Maine. J. Hawkins (June 5): Approximately 30 percent of the corn borers survived in cages at Unity.

Vermont. H. L. Bailey (June 24): Pupae found at Norwich, Windsor County, in the Connecticut River Valley, and at Vernon, Windham County, the southeastern town of the State, the week of May 22. An adult had emerged on June 5 from pupa collected at Vernon, indicating the 2-generation strain. Moderate abundance of larvae found in debris throughout the State.

Massachusetts. A. I. Bourne (June 26): First eggs noted on June 3. These, however, showed the beginning of embryonic development, indicating that they had been deposited 1 or 2 days previously. In the vicinity of the college at Amherst the first eggs were hatching by June 8 or 9.

Connecticut. N. Turner (June 19): Infestation very heavy in New Haven County. Less abundant than last year in the Housatonic Valley. One observation in Hartford showed fewer eggs than expected. Drought of the last month apparently favored oviposition, and apparently infestation will be heavier than usual.

New York. N. Y. State Coll. Agr. News Letter (June 26): R. W. Leiby noted newly hatched larvae of the corn borer, 1/8 inch long, and a few 1/2 inch long were commonly observed in Dutchess and Ulster Counties on June 19 and 20. In earliest sweet corn just beginning to show tassels. Eggs abundant. Pin-hole type of feeding of newly hatched borers common on leaves, most of them being among unfolded blades of the corn bud. In one field in Ulster County eight borer moths observed in 10 minutes; stalks in this field already 100-percent infested, with many eggs unhatched. In Nassau County L. A. Carruth noted moth emergence probably completed; first-generation borers common, the largest about half grown. Experimental control treatments for first-generation borers nearly completed. He observed



in Columbia and Albany Counties moth emergence from overwintered borers from 85- to 90-percent complete. Control work progressing. Eggs relatively abundant. In Dutchess County very young corn borers infesting older plantings of corn 100 percent.

New Jersey. C. A. Clark (June 24): Eggs approximately three times as abundant as in 1938 on early market sweet corn in the Beverly district of Burlington County.

Maryland. E. N. Cory (June 16): Prevalent in potatoes at Pocomoke and Newark, in Worcester County. One pupa found.

Virginia. H. G. Walker and L. D. Anderson (June 26): Found infesting potatoes in Princess Anne County near Pungo on June 20. This is the first record of its occurrence on potatoes in Princess Anne County and the first time it has been found in the Pungo area.

Indiana. J. J. Davis (June 21): Emergence records to date indicate a heavy infestation.

CORN EAR WORM (Heliothis armigera Hbn.)

New York. N. Y. State Coll. Agr. News Letter (June 26): In Nassau County moths are just beginning to appear; one egg and a third-instar larva observed in the field.

Illinois. R. A. Blanchard (June): An occasional egg of corn ear worm observed on sweet corn in central part of the State near Urbana by June 5. On June 7 eggs and newly hatched larvae were abundant on leaves and in buds of early dent corn in the vicinity of Carmi, southeastern section of the State. Examinations in other areas in southern Illinois showed eggs and larvae present on dent and sweet corn but not as abundant as in the Carmi area. All larvae observed were in first and second instars. On June 8 a small patch of early sweet corn, just coming into silk, in the East St. Louis area, had from 5 to 15 eggs on each silk. Dent corn in the same area showed only an occasional egg on the leaves. Occasional larvae, about third and fourth instar, observed. On June 14, a number of examinations of sweet and dent corn near Hanna failed to show any eggs or larvae. Some of the sweet corn beginning to silk.

Kentucky. W. A. Price (June 23): First corn ear worm eggs found at Lexington on June 6.

Alabama. J. M. Robinson (June 21): On corn at Haleyville and Hamilton on June 9.

Missouri. L. Haseman (June 24): Larvae, of presumably the first brood, have been causing considerable damage since the middle of June in southeastern section; boring down into the undeveloped corn tassels. In the central area feeding exposed on the foliage of flowering tobacco.



R. A. Blanchard (June): A 6-acre field of early sweet corn near Charleston, southern part of the State, has eggs or larvae on every plant. The field has about 25 percent of the plants in tassel, with an occasional silk appearing. As high as five larvae observed in a single tassel, and each plant had several eggs on the leaves, tassels, or the silks, if present. Some last-instar larvae observed in the tassels or boring into newly formed ears. About 50 percent of the plants in the early planted dent corn fields had eggs or larvae. Larvae first to third instar.

Kansas. H. R. Bryson (June 24): Considerable injury to curl of early corn.

Oklahoma. C. F. Stiles (June 21): Reported as very numerous in early corn near Durant, Bryan County. Many of the tassels badly damaged.

Texas. K. P. Ewing and W. S. McGregor (June 3): In 2 fields in McLennan County 400 corn plants were inspected, with an average of 17 bollworm eggs found per 100 stalks.

C. R. Parencia and S. E. Jones (June 17): In 4 cornfields in Calhoun County an average of 16.5 percent emergence holes per 100 ears was found.

FALL ARMYWORM (Laphygma frugiperda A. & S.)

Mississippi. C. Lyle (June 24): Grass worm reported as injuring corn in Lee, Lauderdale, Clarke, and Wayne Counties.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Georgia. P. M. Gilmer (June 24): Report received from Cuthbert, near the southern Alabama line, of severe injury to approximately 1 acre of corn. I suspect this may be corn budworm which has been somewhat abundant and has done some damage in isolated fields.

Mississippi. C. Lyle (June 24): Infestation in the southern part of the State reported as lighter than usual.

SUGARCANE BEETLE (Euctheola rugiceps Lec.)

Kentucky. W. A. Price (June 23): Rough-headed cornstalk borer has done some damage to corn in the vicinity of Williamsburg.

Tennessee. G. M. Bentley (June 20): Doing damage to corn at Columbia, Maury County.

Alabama. J. M. Robinson (June 21): On corn at Evergreen, Browns, and Athens on June 1.

GRAPE COLASPIS (Colaspis brunnea F.)

Ohio. J. S. Houser (June 8): Serious damage done to about 3 acres of corn in a larger field at Mansfield, Richland County, southwestern part of the State, which was in small grain in 1938 in which the spring seeding of grass failed. Reported that as many as 15 to 20 larvae could be found in some hills.

T. H. Parks (June 21): Larvae of what is apparently C. brunnea received from Brown County, adjoining Richland County, with statement that they were feeding on roots of corn in land that grew soybeans in 1938.

Indiana. J. J. Davis (June 21): An outstanding pest of corn throughout the State, although most inquiries have been from the southern half. Increasing numbers of reports now being received from northern area. Earliest reports came from southern part on June 8, and by the middle of June larvae were pupating in this area. Injury in most cases was to corn, although one report indicated severe injury to soybeans. Notable that many reports indicated injury as following lespedeza.

Illinois. W. P. Flint (June 20): Very abundant on clover, sweet clover, alfalfa, and soybean ground. Damage reported only on ground planted to these crops in 1938. Several thousand acres of corn in central and south-central parts of the State destroyed by larvae.

Kentucky. W. A. Price (June 23): Has damaged corn extensively in all sections of the State.

Iowa. H. E. Jaques (June): Corn root damage following clover sod occurred in Louisa County.

Missouri. L. Haseman (June 24): Since early in June numerous complaints from southeastern part of the State indicate serious damage by larvae of this pest on the roots of corn. In the central part large numbers of adults were observed on June 18 feeding on grapes.

THRIPS (Thysanoptera)

Connecticut. N. Turner (June 19): Severe damage to 7 acres of silage corn in Southbury, southern part of the State. Generally prevalent on sweet corn.

New York. N. Y. State Coll. Agr. News Letter (June 5): Serious injury to young sweet corn in Rensselaer County was caused by Anaphothrips obscurus Mull. From 800 to 1,000 acres of knee-high corn involved. Injury by this pest to corn is unusual. (June 12): Recorded as being injurious to various grasses and young corn. Seen causing serious injury prior to rains last week to corn in Albany, Schenectady, and Rensselaer Counties. Observed causing light injury to corn in Tompkins and Chemung Counties. (June 19): Also reported in Columbia

and Orange Counties; on both sweet and field corn in the latter county. (June 26): Second generation of thrips now appearing. Injury to corn blades higher on the stalk observed in the Hudson Valley on June 19-20. Injury probably will affect yield, although not serious enough now to warrant control measures. In Ulster County they were present on sweet corn in most fields and causing considerable mottling of the leaves. Present on all parts of some plant over 2 feet high. A new generation of thrips now appearing.

ALFALFA AND CLOVER

ALFALFA WEEVIL (*Hypera postica* Gyll.)

Utah. G. F. Knowlton (May 30): Injury appearing in many fields in northern Utah. Alfalfa being cut early at Lewiston and Trenton, Cache County, owing to weevil damage. (June 5): Injury severe in some fields at Pleasant Grove, Utah County, Draper, Salt Lake County, and North Ogden, with moderate injury rather common in many localities in northern area of the State.

Wyoming. F. V. Lieberman (June 30): Specimens collected in Crook County. (Det. by A. G. Boving.)

Colorado. F. V. Lieberman (June 24): Five larvae collected in Larimer County on June 14. (Det. by A. G. Boving.)

California. A. E. Michelbacher (June 21): Alfalfa fields about Pleasanton were surveyed on June 14. The average number of alfalfa weevil larvae collected to the 100 sweeps of an insect net for the different fields ranged from 0 to 28. In the alfalfa fields adjacent to the San Francisco Bay the count ranged from 0 to 5. In the infested portion of the San Joaquin Valley the second brood of alfalfa weevil larvae is making its appearance. On June 16 the average number of larvae collected in the different fields ranged from 0 to 150 to 100 sweeps of an insect net.

PEA APHID (*Macrosiphum pisi* Kltb.)

Maine. J. Hawkins (June 16): Infestation very general in the central and northeastern parts, but not heavy. All clover and peafields visited found with a light and evenly distributed population.

Nebraska. D. B. Wholan (June 20): Common on first cutting of alfalfa.

Utah. G. F. Knowlton and F. C. Harmston (June 8): Damaging alfalfa in a field near Layton.

COWPEAS

GARDEN FLEA HOPPER (*Halticus citri* Ashm.)

Texas. T. B. Randolph (June 22): Heavy infestation of adults on crotalaria in Hidalgo County on May 31.



F R U I T I N S E C T S

COAST TENT CATERPILLAR (Malacosoma pluvialis Dyar)

Washington. E. J. Newcomer (June 7): Found defoliating many apple, pear, alder, cherry, and other trees, in Snohomish County.

W. W. Baker and B. J. Landis (June 16): Extremely abundant at Gig Harbor, Purdy, and Wollochet Bay on May 24, and at various places on Vashon Island late in May and early in June. Hosts on Vashon Island included apple, cherry, pear, aspen, willow, hazel, mountain-ash, currant, gooseberry, and, to some extent, cultivated Rubus sp. Larvae abundant at Winslow, Bainbridge Island, on June 13, some having migrated to strawberry fields, where occasional feeding was observed. Feeding also observed on Rhamnus purshiana and salmonberry. Larvae abundant over a wide area east of Skykomish on June 11, some feeding observed on thimbleberry, alder, and willow.

ROSE LEAF BEETLE (Nodonota puncticollis Say)

New York. N. Y. State Coll. Agr. News Letter (June 26): Very abundant and damaging apples, peaches, pears, and grapes in southeastern counties the first 2 weeks of June. Still found in small numbers but injury is ceasing.

Pennsylvania. C. C. Hill (June 8): Observed abundant and attacking rose at Carlisle.

OBLONG WEEVIL (Phyllobius oblongus L.)

New York. N. Y. State Coll. Agr. News Letter (June 5): Observed in western New York on apple foliage in Monroe County and on sweet cherry and apples in Wayne County.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (June 19): Infestation on peach at Fort Valley, central Georgia, still greater than that of an average year.

Mississippi. C. Lyle (June 24): Heavy infestations on untreated trees in Lauderdale County.

Oklahoma. F. A. Fenton (June 20): Reported on peach from Welch, Craig County.

Washington. L. G. Smith (June 20): In the migratory stage in north-central Washington.

E. J. Newcomer (June 19): The San Jose scale parasites reported as Aphelinus sp. on page 71 of the Insect Pest Survey

Bulletin dated May 1, 1939, has been determined by A. B. Gahan as Aphytis mytilaspidis (LeB.).

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Massachusetts. A. I. Bourne (June 26): Apparently of normal abundance.

New York. D. W. Hamilton (June 20): At Poughkeepsie moths began emerging in overwintering cages on May 23; first moths captured in bait traps on May 23; and first captured at Kinderhook on May 25. Peak captures in bait traps from May 27 to June 3. Weather conditions very favorable for oviposition and first-brood entrances. First entrances found on June 6 at Poughkeepsie and on June 7 at Kinderhook. Entrances now readily found in orchards where control was poor last year.

N. Y. State Coll. Agr. News Letter (June 12): In eastern New York first entrance found in Rockland County on June 8 and in Columbia County on June 7. (June 19): A few entrances observed in southeastern counties. In western New York eggs laid since May 30. Indications on June 12 were that the lake zone was about a week late. First entrances found in Niagara County on June 12 and in Orleans County on June 13. (June 26): Entrances not numerous in southeastern counties. Moth catches dropping off considerably in the Hudson Valley but moths still being caught and oviposition going on. In western New York entrances easily found in Niagara and Orleans Counties, but only a few in Wayne and Clinton Counties.

Delaware. L. A. Stearns (June 27): First-brood attack about over; infestation approximately average. Emergence period of spring-brood moths from May 5 to June 14, with 50 percent having emerged on May 18-19. Peak of moth flight from May 30 to June 1, with considerable activity about June 12-13.

Maryland. E. N. Cory (June 16): Specimens sent from Easton show presence of moths and injury to apples.

Virginia. A. M. Woodside (June 17): Emergence of spring brood of adults about complete at Staunton, as shown by insectary observations and bait traps. First-brood larvae began to leave fruit about June 9, and a few pupae found on June 16.

Ohio. T. H. Parks (June 21): Bait traps operated in Delaware County, central Ohio, show the peak catch on May 26, with a gradual reduction up to the present. First entrances observed on June 3. Maximum catch at Waterville, near Toledo, was on May 29, with another peak on June 6.

Indiana. L. F. Steiner (June 7): Bait-trap catches in orchards in the Vincennes area total 687 from June 1 through June 7. Heavy hatch

since a week ago. Moths apparently as abundant as a week ago. (June 22): Mature larvae began leaving apples on June 8. Adults of first brood expected to emerge this week. First-brood larvae should begin hatching about July 1. Infestation below normal throughout southwestern Indiana, eastern Illinois, and northern Kentucky.

Illinois. W. P. Flint (June 20): First brood bunched more closely than at any time for the last 5 or 6 years, resulting in very good control.

Wisconsin. C. L. Fluke (June 24): Cool, damp weather of flight period has reduced numbers much below normal.

Iowa. A. P. Parsons (June 10): Severe damage to apples and pears in Union County, south-central Iowa.

Missouri. L. Haseman (June 24): Spring brood more bunched than usual, and comparatively little difference in emergence dates in the southern and northern parts of the State. Peak of emergence during the last 2 weeks in May, and since June 15 very few moths about. First-generation larvae leaving fruit for the last several days in central Missouri. Lightest infestation of first-brood larvae in 10 years throughout the State. In southeastern Missouri the first of the first-generation larvae left fruit on June 6 and pupated on June 8.

Washington. L. G. Smith (June 6): Still a large number of eggs on fruit, and increasing numbers of larval entries noted the last 2 days.

E. R. Van Leeuwen (June 19): Approximately 90 percent of spring-brood moths have emerged at Yakima. Peak of first-brood larvae entering apples and pears took place during the period May 29 to June 3. First larvae to leave fruit taken on June 14. Large numbers of spring-brood eggs continuing to hatch.

Oregon. B. G. Thompson (June 20): Emergence of first-brood adults in the Willamette Valley reached its peak on June 10.

#### FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

Indiana. L. F. Steiner (June 15): Adults appearing in bait traps in the Vincennes area in unusually large numbers. Injury common in untreated orchards.

Illinois. W. P. Flint (June 20): Larvae matured late in May, pupated, and emergence practically complete by June 6. Moths extremely abundant. Ten light traps at Urbana caught over 1,000 moths per trap per night on several nights during the week of June 12. Moths still fairly abundant. Catch now running about 1,000 moths per night for all 10 traps.



Missouri. L. Haseman (June 24): Moths began emerging in southeastern Missouri from June 5 to 11, peak of emergence on June 13. In northeastern Missouri moths began flying on June 1. First moths taken in bait traps in central Missouri on June 2. Peak of emergence from June 15 to 20, and now very few moths still on wing.

Nebraska. M. H. Swenk (June 20): Infested specimens of leaves, buds, and twigs from chokecherry, apple, elm, boxelder, rose, poppy, columbine, and spiraea sent in from Kimball County on June 2.

PISTOL CASEBEARER (Coleophora malivorella Riley)

West Virginia. B. A. Porter (June 9): Larvae and pupae, also dead adults, on apple at Kearneysville on June 3. (Det. by C. Heinrich.)

Illinois. W. P. Flint (June 20): Adults emerging since about June 1. Adults, larvae, and pupae all present in western Illinois on June 6.

APPLE LEAF SKELETONIZER (Psorosina hammondi Riley)

Missouri. L. Haseman (June 24): Damage begun in northwestern Missouri on June 22. Heavy catch of moths in southwestern Missouri on June 17.

APPLE CURCULIO (Tachyterellus quadrigibbus Say)

Pennsylvania. H. E. Hodgkiss (June 22): Eggs observed on June 6 in Juniata County.

Missouri. L. Haseman (June 24): More abundant, and more damage done to pears and certain varieties of apple than ever known before in central Missouri. Adults still feeding and ovipositing, and earlier larvae ready to pupate.

NEW YORK WEEVIL (Ithycerus noveboracensis Forst.)

Massachusetts. A. I. Bourne (June 26): A recurrence of the outbreak in an orchard at South Amherst; appearing on young trees and damaging the new growth. Reported as not as abundant as last year.

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Virginia. A. M. Woodside (June 17): Both fruit and foliage severely damaged in an untreated apple orchard near Staunton during May. Locust seedlings in the orchard as thick and about as tall as the apple trees.

APHIDS (Aphidae)

Connecticut. P. Garman (June 20): Season unfavorable for rosy aphid (Anuraphis roseus Baker) and, although abundant early in the season, little damage has been done.

New York. N. Y. State Coll. Agr. News Letter (June): By the third week in June in the fruit-growing sections of eastern New York and in the lake district the apple aphid (Aphis pomi Deg.) and the apple grain aphid (Rhopalosiphum prunifoliae Fitch) had developed wings and were leaving the fruit trees. Rosy apple aphid more abundant than usual. By the end of the month green apple aphids were becoming numerous again on terminals and fruit in both eastern and western New York. In Dutchess County as many as 25 to 50 found on a single fruit.

Delaware. L. A. Stearns (June 27): Apple aphids relatively scarce; no serious injury reported or observed.

Ohio. T. H. Parks (June 21): Colonies of A. roseus appeared in some orchards early in June but now largely gone. Predators present.

Indiana. L. F. Steiner (June 1): A. pomi increasing steadily in the Vincennes area, although the rosy aphid situation has improved slightly.

J. J. Davis (June 21): A. roseus abundant in some sections of southern Indiana, and at present doing some damage in northern Indiana.

Kentucky. W. A. Price (June 23): Green aphids abundant late in May and early in June. Some foliage injury by rosy aphids but little fruit injury this season.

Wisconsin. C. L. Fluke (June 24): Green apple aphid more numerous than last year in Crawford County.

Missouri. L. Haseman (June 24): Rosy apple aphid still quite troublesome in southeastern Missouri during the first half of June. Of practically no importance this year in central Missouri.

Oklahoma. F. A. Fenton (June 20): Woolly apple aphid (Eriosoma lanigerum Hausn.) reported on apple at Pawhuska, Osage County.

#### APPLE MAGGOT (Rhagoletis pomonella Walsh)

New York. N. Y. State Coll. Agr. News Letter (June 26): Flies began to emerge in traps near Poughkeepsie on June 19, and the number caught on successive days since then has increased normally. First fly observed in Rockland County on June 17; reported a day or two earlier. Apparently more abundant than usual at this time of year.

#### APPLE LEAF-CURLING MIDGE (Dasyneura mali Kieff.)

New York. N. Y. State Coll. Agr. News Letter (June 19): Reported on apples from Monroe and Wayne Counties.

PEACH

PLUM CURCULIO (Conotrachelus nemuphar Hbst.)

Massachusetts. A. I. Bourne (June 26): Apparently of normal abundance.

Connecticut. M. P. Zappe (June): Serious injury to apple, peach, and sour cherry in New Haven County. Apparently more abundant than usual.

New York. D. W. Hamilton (June 20): Injury on apple and cherries at Poughkeepsie more severe than that of the last three seasons.

N. Y. State Coll. Agr. News Letter (June): More abundant and injurious than for years in eastern and western New York on apple, plum, peach, and cherry.

Delaware. L. A. Stearns (June 27): Overwintered adults active from April 19 to June 21, with peak on May 11. Injury rather severe, especially in the southern section of the State, which is normally a two-brooded area.

Virginia. A. M. Woodside (June 17): Larvae fairly abundant in drop peaches in the Crozet section late in May and early in June. Most have now pupated. Infestation very light in the Timberville section.

Georgia. O. I. Snapp (June 19): First-generation adults began to emerge from soil in the insectary at Fort Valley on May 27 and in the rearing room on May 31, a week later than first emergence last year. Peak of emergence in the rearing room on June 4. Jarring in peach orchards revealed a marked increase in adults from May 31 to June 8, owing to emergence of new beetles from the soil. No second-generation egg deposition by June 19. Overwintered beetles not dead as early as usual this year, and a number found on trees in orchards as late as May 31. As a result, early and mid-season varieties of peach, which have been harvested, contained more larvae than usual. Second-generation attack on Hiley, Georgia Belle, and Elberta peaches expected.

J. E. Webb, Jr. (June 24): First-brood beetles now emerging from peaches in the north-Georgia section around Cornelia.

Indiana. J. J. Davis (June 21): Abundant and destructive to peaches and plums in some sections of southern and northern Indiana.

Illinois. W. P. Flint (June 20): Continued abundant. Mating adults taken by jarring in peach orchards during the second week in June.

Mississippi. C. Lyle (June 24): Larvae received from Hinds County on May 29. Reports of injury to peaches in southwestern and east-central Mississippi.



Iowa. A. P. Parsons (June 10): Severe damage to plums and cherries in Union County.

Missouri. L. Haseman (June 24): One of lightest infestations on stone fruits in many years, and very little evidence of injury on apples in central Missouri.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (June 20): First-generation larvae evident in unusual numbers in Fairfield and New Haven Counties. Present in abundance throughout the State. Egg parasitization considerably above normal.

New York. N. Y. State Coll. Agr. News Letter (June 12): Some injury to fruit and twigs in eastern New York the first week of June. (June 26): Found in peach terminals in Niagara County.

Delaware. L. A. Stearns (June 27): Spring-brood emergence ended on June 4. Peak of first-brood twig injury during last week in May. Second brood now active, and twig injury about normal.

Virginia. A. M. Woodside (June 17): Reported from the Charlottesville laboratory that second-brood larvae are developing at least 10 days ahead of last year, twig infestation being at its peak in Albemarle County now.

Georgia. O. I. Snapp (June 19): Infestation at Fort Valley less than that of an average year.

Kentucky. W. A. Price (June 23): Much scarcer this year in Kentucky than last year.

Tennessee. G. M. Bentley (June 20): Very little in peach orchards or in nurseries. Very little found on plum trees. None observed in early apples.

Mississippi. C. Lyle (June 24): Injured peach twigs received from Marion County on May 29, and reports of injury from Simpson, Tallahatchie, Lauderdale, and Holmes Counties late in May and early in June.

Missouri. L. Haseman (June 24): Peak of first-brood moth emergence came on June 5 in southeastern Missouri. Twig infestation by second-brood larvae 50 percent heavier than by first brood. On June 16 a few of these had left the twigs and spun cocoons.

PEACH BORER (Conopia exitiosa Say)

Virginia. A. M. Woodside (June 17): Reported from Charlottesville laboratory that some eggs are hatching in Albemarle County, although most of the moths have not emerged.

Georgia. O. I. Snapp (June 16): Heavy infestation in a peach orchard at Ducker, southwestern Georgia. (June 19): Infestation at Fort Valley heavy in those peach orchards not treated last fall or winter.

Kentucky. W. A. Price (June 23): Adults began emerging at Lexington on June 5.

Nebraska. M. H. Swenk (June 20): Found attacking year-old peach trees in Nemaha County on May 23.

Texas. R. K. Fletcher (June 22): Peach severely injured in Henderson County on June 15.

GREEN PEACH APHID (Myzus persicae Sulz.)

New York. N. Y. State Coll. Agr. News Letter (June 5): Unusually abundant on peach and plum in western New York. Predators also abundant.

CHERRY

CHERRY FRUITFLIES (Rhagoletis spp.)

New York. D. W. Hamilton (June 20): Adults of R. cingulata Loew first taken in emergence cages at Hudson on June 10. Heavy emergence since June 12 in untreated orchards. Adults of black cherry fruitfly (R. fausta O. S.) captured in emergence cages in untreated orchards at Hudson as early as May 31. Emergence ceased on June 7.

Michigan. R. Hutson (June 24): R. cingulata taken at South Haven on June 7 and at Grand Rapids on June 14. R. fausta taken at Hartford on June 9, at Plainwell and Grand Rapids on June 14, and at Moran on June 20.

Washington. R. F. Kern and E. P. Breakey (June 13): Cherry fruitfly (R. cingulata) emerged on June 5 in western Washington.

BLACK CHERRY APHID (Myzus cerasi F.)

New York. D. W. Hamilton (June 20): More prevalent on both sweet and sour cherries throughout the Hudson Valley than for the last three seasons.

Maryland. E. N. Cory (June 13): Reported on cherry at Baltimore.

Tennessee. G. M. Bentley (June 20): Noticed on cherry on May 23 near Smithville, DeKalb County. Several leaves had fallen off the tree, owing to the injury.

Michigan. R. Hutson (June 24): Reported from Grand Rapids and Jackson.

Utah. G. F. Knowlton (June 13): Damaging cherry foliage at Brigham, Centerville, and Springville.

CHERRY FRUIT MOTH (Grapholitha packardii Zell.)

Washington. W. W. Baker (June 16): Sample of 240 cherries from the Kent area brought in on June 7. Only one egg found and this had not hatched by June 16, although apparently alive.

PEAR SLUG (Caliroa cerasi L.)

Ohio. T. H. Parks (June 21): Cherry slug very common on pear and cherry.

Indiana. J. J. Davis (June 21): Cherry slugs reported from several sections of the State, but only in untreated orchards.

Washington. B. J. Landis and W. W. Baker (June 16): Newly hatched larvae observed on sweet cherries at Puyallup, Pierce County, western Washington, on June 3.

L. G. Smith (June 20): Reported on June 14 from Pasco, Franklin County, eastern Washington, as in great numbers on a cherry tree, damaging the leaves badly.

HAWTHORNE LEAF MINER (Profenusa canadensis Marlatt)

New York. D. W. Hamilton (June 20): Adults captured from May 10 to 15 in emergence cages under cherry trees. Larval tunnels first observed in cherry leaves at Poughkeepsie on May 24; larvae had begun leaving the leaves on May 29; practically all gone by June 1. At this time 7 percent of the leaves were injured in one of the more heavily infested orchards. Injury apparently somewhat lighter than in 1938.

PEAR

: PEAR PSYLLA (Psylla pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (June 19): Not abundant in eastern or western New York the first half of June. (June 26): Slowly increasing in numbers and causing some injury in a few orchards in eastern New York.

PEAR LEAF ROLLING MIDGE (Dasyneura pyri Bouche)

New York. N. Y. State Coll. Agr. News Letter (June 12): Reported from Ulster County, eastern New York.

PEAR LEAF BLISTER MITE (Eriophyes pyri Pgst.)

Washington. R. D. Eichmann (May 30): Several reports of injury received from Clallam and Snohomish Counties.



RASPBERRY

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Ohio. E. W. Mendenhall (June 12): Found mildly infesting raspberry canes, especially the red variety, at New Carlisle, Clark County.

Minnesota. A. G. Ruggles and assistants (June 19): Abundant around St. Paul and Minneapolis. Numerous reports from raspberry growers.

Washington. C. F. Webster (June 6): A small amount of damage to raspberries and loganberries on Orcas Island, Island County. Said to be the first time reported in the county.

RASPBERRY SAWFLY (Monophadnoides rubi Harr.)

Ohio. E. W. Mendenhall (June 12): Some damage to leaves of raspberries in some plantations in Fairfield and Clark Counties.

RASPBERRY FRUITWORM (Byturus unicolor Say)

Washington. B. J. Landis (June 16): Adults moderately abundant in raspberries near Startup and Sultan on June 11.

CRANBERRY AND BLUEBERRY

BLACK-HEADED FIREWORM (Rhopobota naevana Hbn.)

Massachusetts. M. D. Leonard (June 20): Reported as very abundant in the Cape Cod cranberry section, especially in the locality of Stoughton.

A BEETLE (Oberea tripunctata Swed.)

North Carolina. B. A. Porter (June 13): A small proportion of cultivated blueberry bushes in an extensive planting at Atkinson infested. (Det. by A. G. Boving.)

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

North Carolina. B. A. Porter (June 13): Moderately abundant in several fields of cultivated blueberry at Atkinson. Feeding on berry clusters. (Det. by H. G. Barber.)

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

New York. N. Y. State Coll. Agr. News Letter (June 26): Nymphs beginning to appear on the undersides of leaves in small numbers in Ulster County.

- Delaware. L. A. Stearns (June 27): Infestation generally light; no control measures necessary.
- Michigan. R. Hutson (June 24): Peak of hatch at Lawton and Paw Paw on June 20.
- Nebraska. D. B. Whelan (June 7): Nymphs and adults on grape leaves.
- Oklahoma. F. A. Fenton (June 20): Reported from Shawnee, Pottawatomie County.
- Montana. H. B. Mills (June 12): Virginia creeper leafhoppers, E. comes ziczac Walsh, abundant at Bozeman this spring. Early attacks noted on dandelion and flowering currant. Many eggs now but no nymphs noted on Virginia creeper and grape.
- Utah. G. F. Knowlton (June 11): E. comes ziczac and E. elegans McA. beginning to spot Virginia creeper and some varieties of grape foliage conspicuously at Farmington, Logan, and Ogden.
- California. C. S. Morley (June 12): Considerable control measures being used in vineyards.

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

- Michigan. R. Hutson (June 24): Peak of hatch on June 7 at Lawton and Paw Paw. Grapes in full bloom.

GRAPE PLUME MOTH (Pterophorus periscelidactylus Fitch)

- Ohio. J. S. Houser (June 2): Damage occasionally done in Ohio by destroying grapes in the fruit-bud stage. Damage noted at Sebring.

GRAPE ROOTWORM (Fidia viticida Walsh)

- Nebraska. D. B. Whelan (June 7): Adults and their injury found on grape leaves near Lincoln.

GRAPE FLEA BEETLE (Altica chalybea Ill.)

- New York. N. Y. State Coll. Agr. News Letter (June 19): Larvae especially numerous and injurious throughout the month in western New York. Reported from Schuyler, Chautauqua, and Niagara Counties.

GRAPE THRIPS (Drepanothrips reuteri Uzel)

- California. S. F. Bailey (June 21): Injury to berries of grape at Sanger not as severe as in 1938, but presence of many adults indicates much potential damage to leaves in July and August.

CITRUS

CITRUS THRIPS (Scirtothrips citri Moulst.)

California. C. S. Morley (June 12): Control measures used a great deal. Showing up more than anticipated the first of the year.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Florida. J. R. Watson (June 21): Summer generation on the wing most of the month.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (June 24): Found in large numbers on pecan in one locality in Hinds County on June 8.

Arizona. C. D. Lebert (June 23): Many infestations observed over the Salt River Valley in citrus and ornamentals. Australian lady-beetle (Rodolia cardinalis Muls.) present in practically all locations and controlling the scale well.

CALIFORNIA RED SCALE (Aonidiella aurantii Mask.)

Arizona. C. D. Lebert (June 23): A small but heavy infestation found in a citrus grove in the Phoenix area on June 11. Eleven trees infested in a 3-acre grove. Control measures under way at present.

YELLOW SCALE (Chrysomphalus citrinus Coq.)

California. R. S. Woglum (June): Becoming more widely distributed than formerly and showing a general increase. Protective district being formed in the Porterville area to prevent establishment.

BLACK SCALE (Saissetia oleae Bern.)

California. R. S. Woglum (June): An increase this year over last season. Build-up apparently not especially severe over the coastal areas, except in occasional groves. Eastern Los Angeles, western San Bernardino, and Riverside Counties show only a slight build-up over last year, but in eastern San Bernardino County, from Etiwanda to Redlands, more pronounced than for several years.

PAPAYA

PAPAYA FRUITFLY (Toxotrypana curvicauda Gerst.)

Florida. J. R. Watson (June 21): Papayas infested with larvae sent in from several localities in the southern part of the State.



TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

South Carolina. C. F. Rainwater (June 8): Specimens forwarded on May 22 from Florence County constitute a new record for the State, as the insect was recorded previously from Charleston and Oconee Counties only. (Det. by L. L. Buchanan.)

Mississippi. C. Lyle (June 24): Adults received from Copiah, DeSoto, and Lawrence Counties the latter part of May.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Ohio. T. H. Parks (June 21): Sent in from Cincinnati on June 14 with the statement that the beetles were feeding below the crowns of calliopsis and marigolds.

Nebraska. D. B. Whelan (June 5): Tomatoes, cabbage, and cultivated sunflower eaten underground.

FLEA BEETLES (Halticinae)

Maryland. H. L. Dozier and L. W. Saylor (June 4): Systema blanda Melsh. taken from and on dahlias, injuring the foliage of young plants at Cambridge on June 4. (Det. by H. S. Barber.)

Kentucky. W. A. Price (June 23): Two-lined flea beetle (S. taeniata Say) unusually abundant in May and early in June at Lexington, causing considerable damage to lima beans, bush beans, tomatoes and other vegetables.

Mississippi. C. Lyle (June 24): Specimens of Phyllotreta sinuata Steph. received from Copiah County on May 11. Feeding on turnips.

Nebraska. D. B. Whelan (June 20): Western cabbage flea beetle (P. pusilla Horn) numerous on turnips and radishes near Lincoln in May and early in June.

Utah. G. F. Knowlton (June 1): The banded flea beetle is seriously damaging foliage of cucumber, beans, swiss chard, beets, peppers, lettuce, and radishes at Caineville, killing many of the plants. (June 3): Striped flea beetles (P. vittata F.) seriously injuring cantaloups at Green River.

Washington. L. G. Smith (May 30): P. vittata was causing severe damage to turnips and young tomato plants in the Spokane Valley on May 24.

SEED-CORN MAGGOT (Hylemya cilicrura Rond.)

Tennessee. G. M. Bentley (June 20): Reported as damaging corn and beans in Obion County on May 17.

North Dakota. J. A. Munro (June 22): Observed to be present in cut seed pieces in practically all potato fields examined in the vicinity of Walhalla. Found occasionally in fields throughout the northern Red River Valley counties. Reported as troublesome in fields at Mandan.

Utah. G. F. Knowlton (June 15): Lima bean plantings damaged recently in various parts of Davis County. Injury to beans also reported from Salt Lake and Utah Counties.

BANDED GREENHOUSE THRIPS (Hercinothrips femoralis Reut.)

Florida. J. R. Watson (June 21): A heavy infestation in a greenhouse at Gainesville on a variety of plants, including Mexican clover (Richardia sp.).

FALSE CHINCH BUG (Nysius ericae Schill.)

North Dakota. J. A. Munro (June 22): Reported as injurious to flax and garden plants from many scattered points in the State.

Arizona. C. D. Lebert (June 23): Several heavy infestations observed in the valley during June, mostly annoying people by invading their homes and migrating over flower beds and shrubs. Several borders of young cotton destroyed in the Peoria area, west of Phoenix, on June 5.

SOUTHERN MOLE CRICKET (Scapteriscus acletus R. & H.)

North Carolina. W. A. Thomas (June 10): Adults still numerous around bright lights in the vicinity of Chadbourn, and there seems to be more evidence of their presence in fields than in former years.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New York. N. Y. State Coll. Agr. News Letter (May 29): In eastern New York beetles are appearing in formidable numbers on Long Island and in Rockland County. First eggs observed in Nassau County on May 17 on potatoes and in Rockland County on May 25 in a field of newly set tomato plants where the population averaged about 50 beetles per 100 plants, and plenty of eggs. Beetles reported in rather large numbers in Oswego County, western New York. Numbers of eggs found on May 24 in Suffolk County. (June 12): Larvae now hatching quite rapidly on Long Island and several growers applying control measures for the last two days. In Wayne County eggs have been hatching on muck for several days. In one potato planting in Erie County there was an average of 5.5 beetles per plant, the plants averaging 6 inches high. Egg masses numerous.

Tennessee. G. M. Bentley (June 20): Beetles beginning to appear and lay eggs in DeKalb County on May 18. Apparently not as much damage as at this time last year.

Mississippi. C. Lyle (June 24): Some injury to tomatoes reported from Lauderdale and Webster Counties and to eggplant in Pearl River County.

Iowa. H. E. Jaques (June): Fairly numerous in the southern half of the State and spotted infestations in O'Brien and Worth Counties, in the northern half.

Nebraska. M. H. Swenk (June 20): Reported as very injurious on potato plants in Colfax County on June 1.

D. B. Whelan (June 20): Adults numerous in Lincoln late in May. Larvae were doing considerable damage and full grown by June 10

Kansas. H. R. Bryson (June 24): Unusually abundant this year.

Utah. G. F. Knowlton (June 15): Outbreak at Clinton, Davis County, at Uintah, Roy, Riverdale, Marriott, Slaterville, Farr West, Plain City, West Weber, and Taylor, all in Weber County, and at Wilson, Millard County, is the worst for at least 3 years. Program to secure thorough treatment is now underway.

#### FLEA BEETLES (Epitrix spp.)

Connecticut. N. Turner (June 19): Severe infestations of E. cucumeris Harr. on newly set tomato plants throughout the State. Some damage to spinach. Potatoes apparently more heavily infested than usual.

Maryland. E. N. Cory (June 24): Severe injury to potatoes on most farms in Worcester County.

Kentucky. W. A. Price (June 23): Tobacco flea beetles (E. parvula F.) caused considerable damage to tomato plants in the vicinity of Lexington during the latter part of May.

Nebraska. D. B. Whelan (June 20): A few adults of E. cucumeris reported at Lincoln on young potato leaves.

Montana. H. B. Mills (June 15): Western flea beetle (E. subcrinita Lec.) somewhat more abundant this year than in recent years in Valley, Yellowstone, and Gallatin Counties. Attacking potato, tomatoes, and other truck.

Washington. C. B. Whiting (June 20): Reported from Mount Vernon, Skagit County, that the first tuber injury by E. cucumeris noted this year on small tubers about the size of filberts. Adults of both the eastern (E. cucumeris) and the western species (E. subcrinita) quite prevalent in the fields this month.



Oregon. K. W. Gray (June 21): E. cucumeris reached the peak of emergence on May 29 in Deschutes County. Some still emerging. First eggs obtained on June 1.

CORN EAR WORM (Heliothis armigera Hbn.)

South Carolina. J. G. Watts (June 15): About one-third of early tomatoes in commercial plantings in Denmark, Bamberg County, have been damaged, even when control measures were used.

Georgia. T. L. Bissell (June 13): Damage to tomatoes beginning to show up, with the first fruit at full size. Not many worms can be found in corn.

Mississippi. C. Lyle (June 24): Specimens received from Leflore County on June 11, with report that corn was seriously injured, and from Holmes County. Also reported as feeding on corn in Lauderdale County and on tomatoes in Covich, Holmes, Lauderdale, Lincoln, Oktibbeha, and Pearl River Counties. First crop of tomatoes reported as destroyed in Pearl River County.

E. W. Dunnam, et al. (June 3): One larva found in tomato fruit grown in Leland, Washington County.

Kentucky. W. A. Price (June 23): First injury to tomatoes found on June 21 at Lexington.

HORNWORMS (Protoparce spp.)

South Carolina. J. G. Watts (June 20): Since June 10 commercial plantings of tomatoes at Denmark are suffering some defoliation and fruit injury from P. sexta Johan. At Blackville, in Barnwell County, considerable injury has been done in some home plantings. A few observed feeding on potato and pepper.

Georgia. T. L. Bissell (June 13): A few eggs present on tomatoes with evidence of feeding.

POTATO APHID (Macrosiphum solanifolii Ashm.)

Virginia. H. G. Walker and L. D. Anderson (June 26): The pink and green potato aphid became moderately abundant on potatoes in Northampton County about harvest time. They have also been attacking tomatoes in this area and have caused rather serious damage in some tomato fields.

Utah. G. F. Knowlton (June 10): Less common and injurious this spring than usual.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

South Carolina. J. G. Watts (June 16): Abundant on small home plantings of potatoes at Blackville.

POTATO AND TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Nebraska. M. H. Swenk (June 20): Report received from Buffalo County on June 12 as being numerous on potato and also present on tomato.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Connecticut. N. Turner (June 19): Adults appeared in usual numbers late in May. Damage light in general, with a few heavy, local infestations.

New York. M. D. Leonard (June 10): Reported as just beginning to appear in some bean fields around Roslyn and several other localities in that section of Nassau County.

N. Y. State Coll. Agr. News Letter (June 12): Beetles laying eggs in Rockland and Suffolk Counties on June 9. In central New York the first beetle taken in western Steuben County on beans on June 3 in a field where there were many beetles last year. First beetle taken in Erie County on June 6. Evidences of adult feeding observed the rest of the week on snap and lima beans. No egg masses found. (June 19): Present in Schuyler County, western New York, for nearly 3 weeks on early plantings of snap beans, and observed in Allegany County. First adults in Wayne County observed on June 15. (June 26): Observations made from June 19 to 23 in the Hudson Valley indicate a heavy survival of beetles, and infestations on snap bean plantings reached point where control of adults necessary. They were laying eggs and about 10 percent of the eggs had hatched. Beetles being found generally on the early planted beans grown in up-State New York. Average of 25 beetles on each 100 field-bean plants in sections of Steuben and Allegany Counties. A few eggs beginning to hatch on June 22. In Livingston County many fields yield beetles, and egg laying has been going on for about a week.

North Carolina. W. A. Thomas (June 9): Particularly abundant during the spring and has defoliated most of the beans in home gardens, causing, in a few instances, serious damage to both soybeans and cowpeas at Chadbourn.

Georgia. T. L. Bissell (June 13): Inquiries about this beetle have come in from Fulton and Pike Counties, central Georgia, and from Grady County, southwestern Georgia. Damage about normally severe in central Georgia.

H. I. Borders (June 16): Snap beans in the southern Georgia area fairly heavily infested. Unusually early this season in a number of cases.

Florida. F. S. Chamberlin (June 24): Reported as very abundant in the eastern part of Gadsden County.

Indiana. J. J. Davis (June 21): Present in threatening numbers in all parts of Indiana.

Tennessee. G. M. Bentley (June 20): Observed earlier this year than for many seasons. Appearance more pronounced in the upland areas of the State.

L. B. Scott (June 21): Normally abundant on beans in north-central Tennessee.

Alabama. J. M. Robinson (June 21): Reported from Sumter County as appearing for the first time at Cuba, which is about 120 miles southwest of Birmingham. Very abundant at Auburn.

Mississippi. C. Lyle (June 24): Specimens received from Scott County on June 11 and Oktibbeha County on June 21. Other reports of injury to beans in these counties received, as well as in Clarke, Lauderdale, Newton, and Tishomingo Counties. Also reported as causing the usual damage over the northeastern part of the State.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Delaware. L. A. Stearns (June 20): Unusually abundant and destructive in western Sussex County in the vicinities of Laurel and Seaford.

North Carolina. W. A. Thomas (June 9): Very destructive to cowpeas, beans, soybeans, limas, and snap beans at Chadbourn.

Indiana. J. J. Davis (June 21): Reported from many sections of the State, and its injury confused with that of the Mexican bean beetle. First authentic record of the season from Bloomington on May 25.

Tennessee. G. M. Bentley (June 20): Reported as appearing in the usual numbers in DeKalb County on May 18.

PEAS

PEA APHID (Macrosiphum pisi Kltb.)

Connecticut. N. Turner (June 19): Some damage to late garden peas. A few growers preparing to use control measures.

New York. N. Y. State Coll. Agr. News Letter (June): Very abundant and injurious in western New York the first of June, after which time the aphids disappeared.



Pennsylvania. H. E. Hodgkiss (June 22): Infestation relatively small in southeastern Pennsylvania on May 24.

Tennessee. G. M. Bentley (June 20): Reported as damaging garden peas near Nashville, Davidson County, on May 20. Damage light.

Mississippi. C. Lyle (June 24): Specimens received from Kemper County on May 23. Feeding on English peas.

Nebraska. M. H. Swenk (June 20): Complaint of damage to peas received from Colfax County on May 29.

Utah. G. F. Knowlton (May and June): Damaging late canning peas in northern Utah.

#### PEA WEEVIL (Bruchus pisorum L.)

New York. N. Y. State Coll. Agr. News Letter (June 12): Numerous and growers worried in Orleans County, western New York.

Idaho. J. R. Douglass (June 9): Numerous in southern part of the State.

Utah. G. F. Knowlton (June 5): Adults common in one small field of peas south of Pleasant Grove, Utah County.

Washington. L. G. Smith (May 30): From observations made to date, it looks as though there may be considerable damage caused this season. (June 13): Green-pod peas in the Spokane Valley found infested. Numerous eggs deposited on the developing pods.

#### CABBAGE

##### CABBAGE MAGGOT (Hylemya brassicae Bouche)

Connecticut. N. Turner (June 19): Severe damage to untreated fields of cabbage, cauliflower, and broccoli, ranging up to almost a total loss. Cauliflower, even when treated, damaged 10 to 20 percent

New York. H. Glasgow (May 27): Egg laying by cabbage maggot has about reached its peak today at Geneva.

N. Y. State Coll. Agr. News Letter (May and June): Unusually abundant.

Wisconsin. C. L. Fluke (June 24): Very numerous in all parts of State, wherever cabbages are grown, particularly central, southern, and eastern counties.

##### CABBAGE CURCULIO (Ceutorhynchus rapae Gyll.)

Wisconsin. C. L. Fluke (June 24): Present in damaging numbers in Dane and Outagamie Counties in cabbage seedbeds. Near Milwaukee common in kohlrabi.

Minnesota. A. G. Ruggles and assistants (June 19): Attacking cabbage at Hopkins on May 17. Moderately abundant.

Nebraska. D. B. Whelan (June 20): Numerous in a garden at Lincoln late in May and early in June. First time observed at Lincoln.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Indiana. J. J. Davis (June 21): Abundant and destructive in the southern tier of counties along the Ohio River.

Mississippi. C. Lyle (June 24): Specimens received from Pike and Simpson Counties on May 29 and June 1, respectively. Feeding on garden vegetables.

Texas. R. K. Fletcher (June 22): In Milam County on May 26, causing severe injury in garden.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

New York. N. Y. State Coll. Agr. News Letter (June 5): A very few specimens observed in Ulster County on June 1. One observed in Monroe County on May 30. (June 12): One adult seen in Albany County. (June 19): First squash bugs found this week in Rockland County. (June 26): Eggs being laid, but none hatched by June 20 in Dutchess and Ulster Counties.

Missouri. L. Haseman (June 24): In central Missouri adults began to appear on squashes on June 20. Very few complaints received from throughout the State.

Nebraska. M. H. Swenk (June 20): Request for information on control received from Garden County on June 3.

Washington. I. M. Ingham (June 13): Eggs still being found in Franklin County on June 9, but no nymphs have appeared.

MELONS

CUCUMBER BEETLES (Diabrotica spp.)

Massachusetts. A. I. Bourne (June 26): About June 8 complaint received of rather extensive and serious damage caused by the striped cucumber beetle (D. vittata F.) eating into the forming heads of lettuce. Beetles unusually abundant and feeding upon the central leaves.

Connecticut. N. Turner (June 19): Emergence of D. vittata in May and June very heavy. Severe damage to untreated fields of squash and melons.

New York. N. Y. State Coll. Agr. News Letter (June 19): Striped cucumber beetles very abundant in Nassau and Rockland Counties, eastern New York, causing severe injury to cucumbers and squash.

South Carolina. J. G. Watts (June): D. duodecimpunctata L., D. vittata, and D. balteata Loc. less abundant than last month, probably owing to dry, hot weather. The spotted species is noticeably more abundant than the other two. A dipterous parasite has been reared from the spotted and striped species. From small sample rearings approximately 3 percent of the adults were parasitized.

Mississippi. C. Lyle (June 24): Adults of D. duodecimpunctata and D. vittata were feeding on watermelons in Oktibbeha County on May 25 and in Attala County on June 9. Complaints of injury to cantaloups, cucumbers, and watermelons received from Forrest County on May 17, Rankin County on June 9, Covington County on June 13, and Lauderdale County on June 22.

Minnesota. A. G. Ruggles and assistants (June 19): Striped cucumber beetle very abundant in Anoka County, especially on melon plants.

Missouri. L. Haseman (June 24): In central Missouri very little evidence of either the striped or spotted cucumber beetles on cucurbits. In southeastern Missouri damage to melons moderately light in June.

MELON APHID (Aphis gossypii Glov.)

Connecticut. N. Turner (June 15): At Cheshire  $\frac{1}{2}$  acre of early squash very heavily infested, and many plants killed. Few aphids found in several other nearby fields.

Missouri. L. Haseman (June 24): Some reports of heavy damage to watermelons in southeastern Missouri. No damage observed in central Missouri.

Oklahoma. R. G. Dahms (June 18): Some damage to melons in Grady and Stephens Counties.

PICKLEWORM (Diaphania nitidalis Stoll)

South Carolina. J. G. Watts (June 15): First specimen observed at Blackville on June 15, when a half-grown larva was found in a cucumber. Taken since that time in cantaloups and squash. From a field examination on June 19 about 0.5 percent of small cantaloups were infested.

Georgia. F. W. Roddenbury (June): Noticed at Cairo about June 1.

Florida. F. W. Roddenbury (June): First observed at Madison about May 25.



ASPARAGUS

ASPARAGUS BEETLES (Crioceris spp.)

- Massachusetts. A. I. Bourne (June 26): C. asparagi L. subject of many complaints throughout the State and in southern Hampden County apparently very abundant. Reports elsewhere indicated it as of normal abundance.
- New York. N. Y. State Coll. Agr. News Letter (June 5): In Suffolk County both species of asparagus beetles very abundant and laying eggs during the last week. (June 12): In Nassau County larvae and adults of C. asparagi very abundant on asparagus plantings. Asparagus beetles moderately abundant in Albany County and prevalent on lowland beds in Delaware County on May 24 and eggs being laid by May 29. In western New York asparagus beetles have been laying eggs for some time in Chautauqua County and have been numerous and destructive, where not controlled, in Orleans County.
- Pennsylvania. H. E. Hodekiss (June 22): C. asparagi and C. duodecim-punctata L. fairly abundant and eggs plentiful on May 23.
- South Carolina. J. G. Watts (June): C. asparagi has not developed as rapidly during the month as was expected. Abundance only slightly more than that of last month. A dipterous parasite reared from larvae collected on May 18. This is about 2 months earlier than the first parasites were taken last year at Blackville.
- Michigan. R. Hutson (June 24): C. asparagi reported from Conklin, Royal Oak, and East Lansing.
- Washington. A. E. Lovett (June 6): Previous reports of C. asparagi attacking fields around Kent and Auburn, King County, now confirmed.

CELERY

APHIDS (Aphiidae)

- New York. N. Y. State Coll. Agr. News Letter (May 29): One very severe infestation of aphids (probably melon aphid) on sash celery in Orange County.

TARNISHED PLANT BUG (Lygus pratensis oblineatus Say)

- Massachusetts. A. I. Bourne (June 26): On June 22 complaint received of rather serious damage to celery in the market-garden section in the eastern part of the State.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (June 19): Severe infestation at Mount Carmel Farm and some small farms in New Haven County. Large fields in Hartford County show little infestation now.

ONION MAGGOT (Hylemya antiqua Meig.)

Wisconsin. C. L. Fluke (June 24): Quite general in southeastern counties

Oregon. R. G. Thompson (June 20): Attack more general than usual in the Willamette Valley.

RHUBARB

A TERMITE (Reticulitermes tibialis Banks)

Nebraska. M. H. Swenk (June 20): Reported as destroying rhubarb plants in Sherman County on June 5.

LETTUCE

SIX-SPOTTED LEAFHOPPER (Macrosteles divinus Uhl.)

New York. N. Y. State Coll. Agr. News Letter (June 5): Abundant on lettuce on Long Island and in Genesee County.

SWEETPOTATO

IMBRICATED SNOUT BEETLE (Epicaerus imbricatus Say)

Alabama. J. M. Robinson (June 21): On sweetpotatoes at Centerville and Athens.

HOPS

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Washington. L. G. Smith (June 20): Omnivorous leaf tier working into heads of hops at Roy, King County, causing them to bend over, or "crook." None observed in the locality before this season.

STRAWBERRY

WEEVILS (Brachyrhinus spp.)

Michigan. R. Hutson (June 24): B. ovatus L. troublesome in houses at Traverse City.

Utah. G. F. Knowlton (June 8): B. ovatus and B. rugosostriatus Goeze adults are maturing and some emerging in Cache and Utah Counties.

G. F. Knowlton and D. L. Bischoff (June 10): Adults of B. ovatus abundant on strawberries at Willard. A number of raspberry patches being damaged at Orem.

Washington. L. G. Smith (June 13): Adults of B. ovatus and B. sulcatus F. are emerging in the Spokane area. After 3 years' absence from Franklin County, the weevil has appeared again near Pasco, adults of B. ovatus having been found.

#### STRAWBERRY LEAF ROLLERS (Tortricidae)

Ohio. T. H. Parks (June 21): Cacoccia obsoletana Walk. reported as damaging strawberries in Hamilton County.

Nebraska. M. H. Swenk (June 20): Ancyliis comptana Froel. reported as damaging leaves of strawberry plants in Jefferson County on May 27.

Washington. B. J. Landis and W. W. Baker (June 16): Larvae of a leaf roller extremely abundant in an abandoned strawberry field near Winslow, Bainbridge Island, on June 13. A few larvae found nearby in producing fields.

#### WHITEFLIES (Aleurodidae)

Massachusetts. A. I. Bourne (June 26): Several complaints received of abundance of a species of whitefly on foliage of strawberries, and these were found in moderate abundance on plantings at Amherst.

#### A ROOT WORM (Graphops pubescens Melsh.)

Indiana. J. J. Davis (June 21): Strawberry root worm destructive to strawberry in southern Indiana.

#### BEETS

##### SPINACH LEAF MINER (Pegomya hyoscyami Panz.)

Connecticut. N. Turner (June 19): Small fields of early beets heavily infested and many plants killed. Some damage to early spinach.

##### SPINACH CARRION BEETLE (Silpha bituberosa Lec.)

Montana. H. B. Mills (June 12): Attacking small beets at Cascade, Pondera County.



TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

North Carolina. W. A. Shands (June 24): Infestations and injury to newly set tobacco unusually light in southeastern and north-central North Carolina.

Georgia. H. I. Borders (June 16): Tobacco flea beetles have appeared in several localities in southern Georgia. Tobacco damaged to some extent. Control measures have been recommended and are being used against them.

HORNWORMS (Protoparce spp.)

North Carolina. W. A. Shands (June 24): Larvae more abundant, and injury more widespread and severe to tobacco than observed this early in the season during the last 4 years in southeastern, central, and north-central North Carolina.

Kentucky. W. A. Price (June 23): Small larvae of the tobacco hornworm began appearing on tobacco the second week in June at Lexington.

Tennessee. L. B. Scott (June 21): P. quinquemaculata Haw. and P. sexta Johan. more abundant on tobacco in north-central Tennessee than for several years.

POTATO TUBER WORM (Gnorimoschema operculella Zell.)

Florida. F. S. Chamberlin (June 13): Splitworm more abundant in shade- and sun-grown tobacco than in the last several years in Gadsden County.

CORN ROOT WEBWORM (Crambus caliginosellus Clem.)

Tennessee. L. B. Scott (June 21): Moderately abundant in many tobacco fields in north-central Tennessee but, with few exceptions, infestation not severe. Damage moderate in fields not cultivated in 1937 and 1938.

A WEBWORM (Acrolophus popeanellus Clem.)

Tennessee. L. B. Scott (June 21): This webworm ordinarily causes very little damage to tobacco in north-central Tennessee, but is moderately abundant this year. One 3-acre field found to be 80-percent infested, necessitating replanting of the field. Many more than usual are present.

TOBACCO THRIPS (Frankliniella fusca Hinds)

Florida. F. S. Chamberlin (June 6): Much less abundant than normal in Gadsden County, this condition apparently owing to the heavy, frequent rains.

C O T T O N   I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy and C. F. Rainwater (June 10): Boll weevils still emerging from cages at Florence. Total of 740 emerged during May and only 216 during May of 1938. Weevils not as numerous in the fields of Florence County as last year, there being 1 weevil for 348 plants, as compared to 1 weevil for 209 plants in 1938. A number of egg punctures found.

F. F. Bondy, C. F. Rainwater, and F. F. Bibby (June 17): Flight screen catches in Florence County indicate that weevils are still emerging. A total of 199 taken from trap crop in June 1938, and to date 464 taken from trap crop of June 1939. Number of weevils found in fields about same as in 1938. (June 24): Weevil counts in fields of Florence County showed check plots 4.9-percent infested; presquare and early treated plots 2.7-percent infested, about the same as in 1938. A number of fields found with 10-percent infestation and higher are now being treated. A large number of first-generation larvae in squares now falling to ground.

Georgia. P. M. Gilmer, et al. (June 3): Infestation apparently about at the peak now in Dooly, Berrien, Tift, Cook, Lowndes, and Echols Counties. No increase noted except in occasional fields. Infestation spotted, very heavy in some fields and rather light in others, apparently correlated with distance from last year's cotton. Infestation apparently somewhat lighter than last season. (June 10): Very heavy populations of hibernating brood observed in Tift, Cook, Berrien, and Lowndes Counties. Untreated fields often show considerably above 10-percent infestation, averaging over all fields close to 5 percent. Generally spring infestation from hibernating weevils that are actually ovipositing is about average, or a little heavier than average throughout the whole area involved. Reports from northern Georgia indicate a severe infestation, heavier possibly than last year. Hibernators reported as hand-collected at the rate of approximately 200 per acre on untreated cotton. Treated cotton adjacent reported to carry weevils at the rate of about 1 weevil per 2 acres.

P. M. Gilmer (June 17): Injury mounting in untreated fields in Tift, Berrien, and Cook Counties, and to some extent in treated ones. Weevil populations still rather high and percentage of injured squares somewhat on the increase. Moist weather apparently favorable to old adults and they are still present, while the first-brood population is beginning to appear. (June 24): Infestation decreasing as the interbrood period appears in Cook, Berrien, Tift, and Lowndes Counties. Total infestation reduced to considerably below half that of last week. First-generation weevils emerging in considerable numbers and peak expected next

week. Damage indicated in the coastal regions from first-brood weevils, as infestation rose sharply in that section last week. Upper coastal plain section shows no indication of extensive oviposition by this brood.

L. W. Morgan (June 23): Owing to hot and dry weather in Lowndes and Echols Counties, there has been almost no damage. One newly emerged weevil found.

Florida. C. S. Rude (June 10): Of 26 fields inspected in Alachua, Putnam, Marion, Gilchrist, and Union Counties all found infested, except 3 in Putnam County. Infestation highest in Alachua County, 42.1 percent. Infestation in Marion, Union, and Gilchrist Counties much higher than last year.

L. C. Fife and C. S. Rude (June 17): During the week 24 treated and untreated fields examined in Lake, Marion, Alachua, Putnam, Union, and Gilchrist Counties. No infestation found in Putnam County, but in the other counties it ranged from 0 to 88.6 percent, the latter in Alachua County. (June 24): Infestation has increased in the above counties during the last week. Light infestation found in 1 field in Putnam County. Infestation somewhat heavier than a year ago.

Alabama. J. M. Robinson (June 21): More abundant than usual in cotton-fields at Auburn; 5 to 6 found per 200 plants. Also abundant in Lee and Macon Counties.

Mississippi. C. Lyle (June 24): Reported as abundant in most cotton-fields in the northwestern, central, and southwestern parts of the State.

State Plant Board (June 5): North-central section of the State most heavily infested of the counties examined; no reports received from the southern half. Highest infestation recorded from Webster, Attala, Holmes, and Choctaw Counties. (June 12): Generally abundant throughout the north-central and eastern sections of the State, 24 out of 25 farms being infested in Oktibbeha County. Most Delta counties and those along the Tennessee line showed very few or no weevils, the usual condition at this time. (June 19): Heaviest infestations in north-central Mississippi in Lee, Monroe, Holmes, Yalobusha, and Grenada Counties. (June 26): Infestation rose during the last week. On farms where squares were large enough to be punctured average infestation was 22 percent, as compared with  $14\frac{1}{2}$  percent last week. Heaviest infestations in Monroe and Chickasaw Counties. Generally abundant throughout the rest of the State.

E. W. Dunnam and assistants (June 3): On 1,000 plants examined on a farm in Washington County, 22 weevils were found. This is the date on which weevils were reported in 1935-1938,



inclusive. Weevils found 1 week earlier this year. (June 17): On a treated check plot only a 10-percent infestation found. (June 24): Weevils found on 6 farms in Washington County this week totaled 120, as compared with 124 last week; 218 in 1938; 39 in 1937; and 2 in 1936.

R. L. McGarr, et al. (June 3): Inspection of 1,400 cotton plants in 7 fields in Oktibbeha County this week showed 1.9 weevils per 100 plants, as compared with 2.5 in 1938. (June 17): In Oktibbeha and Lowndes Counties average number of weevils per 100 plants from 6,400 cotton plants inspected in 26 fields this week was 1.3, as compared with 1.1 at this time last year. (June 24): During the week 3,200 squares examined in 12 fields in Oktibbeha County showed an average infestation of 24.5 percent, as compared with 21.6 percent at this time last year. Infestation in different fields ranged from 10 to 36.7 percent.

Louisiana. R. C. Gaines and assistants (June 3): Examinations to determine population in cotton fields at Tallulah, Madison Parish, for the period May 31 to June 6 showed 273 weevils on 36,000 plants, as compared with 306 weevils on 50,000 plants in 1938. (June 17): Quite a few squares punctured in some fields of older cotton in Madison Parish. (June 24): In 30,200 squares examined in Madison Parish during the week, 1,536 punctured squares were found, an average of 5.1 percent. Records made on fields most likely to be heavily infested. Square infestation in these fields ranged from 0.5 to 18.7 percent. No control used in any of these fields. In 34 fields 24 weevils taken in 5,800 sweeps of the net. Initial population at Tallulah slightly higher in 1939 than in 1938.

Texas. F. L. Thomas (June 20): Increasing and now causing damage in half of the 26 fields examined in Austin, Colorado, Fayette, Waller, and Wharton Counties, southeastern Texas, and in 18 of 32 fields examined in Bastrop, Brazos, Burleson, Grimes, Milan, and Williamson Counties, south-central Texas.

R. W. Moreland (June 10): Total number of weevils removed from hibernation cages in Brazos County amounts to 650, or 2.6 percent.

C. R. Parencia and S. E. Jones (June 3): A few found in Calhoun County, a few squares in older cotton being punctured. (June 24): Generally scarce in Calhoun County but doing considerable damage in some fields. Control measures used by several growers this week. Infestation on cooperative variety tests on June 20 averaged 2.6 percent of the squares punctured.

K. P. Ewing and W. S. McGregor (June 3): In McLennan County 21 weevils were found on 3,700 cotton plants in 22 fields, located both in the river bottom and in the open-prairie section.

(June 10): Only 6 weevils found on 8,500 cotton buds checked in 27 fields. Decrease due to cotton beginning to fruit and the weevils' leaving the buds. (June 24): In 1,000 squares counted in 4 fields in McLennan and Falls Counties, 29 punctured squares found, averaging 2.9 percent.

Oklahoma. C. F. Stiles (June 21): Showing up in fairly large numbers throughout southeastern Oklahoma.

A WEEVIL (Epicacrus formidolosus Boh.)

Florida. J. R. Watson (June 21): Specimens submitted. Reported as doing serious damage to cotton at Valrico, Hillsborough County.

A WEEVIL (Conotrachelus crinaceus Lec.)

Tennessee. S. Marcovitch (June 10): Small weevil found injuring buds of very young cotton in Knoxville. (Det. by L. L. Buchanan.)

BOLLWORM (Heliothis armigera Hbn.)

South Carolina. F. F. Bondy, C. F. Rainwater, and F. F. Bibby (June 17): Several adults caught in Florence County, but no damage found. (June 24): A few adults found.

Georgia. P. M. Gilmer (June 17): Present in Tift, Berrien, and Cook Counties, but apparently little damage to squares or bolls.

Alabama. J. M. Robinson (June 21): On cotton at Troy and Hartselle.

Mississippi. E. W. Dunnam, et al. (June 24): Three larvae found in squares in Washington County.

Texas. C. R. Parencia and S. E. Jones (June 3): A few eggs found during the week in Calhoun County; 7 eggs found on 100 terminal buds in a field. A few small larvae observed feeding on terminal buds. (June 24): Only 2 eggs observed this week

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. H. S. Cavitt (June 3): Total moth emergence this week at Presidio only 35, as compared to 104 last week.

A. J. Chapman (June 17): A few moths continued to emerge from hibernation this week at Presidio. Records thus far indicate a lower survival this year than last. (June 24): Of 8,639 blooms examined in cotton planted in Presidio on March 28, 2,136, or 24.72 percent, were infested. A total of 1,897 blooms examined in cotton planted on April 20, and 282, or 14.86 percent, were infested. Bloom-infestation records made in 7 fields in Presidio County during the week showed infestations ranging from 0 to 1.6 percent.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. C. R. Parencia and S. E. Jones (June 10): One found on a farm 5 miles southwest of Port Lavaca on June 9, being the first observed since May 17. (June 24): Several young larvae found on cotton on a farm 4 miles northwest of Port Lavaca on June 22.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy, C. F. Rainwater, and F. F. Bibby (June 24): A few found in Florence County but no damage.

Georgia. P. M. Gilmer, P. A. Glick, and R. T. Harwell (June 3): Present in the north-central area of Dooly, Berrien, Tift, Cook, Lowndes, and Echols Counties, but no damage being done. Apparently more prevalent about Cordole than west or north of the town.

Mississippi. C. Lyle (June 24): Reported as having done light damage to cotton in Holmes and Quitman Counties during the first half of June.

R. L. McGarr and assistants (June 3): On the terminal buds of 1,400 cotton plants this week in Oktibbeha County an average of 0.9 adult per 100 buds was found, as compared with 3.2 adults and 0.4 nymph found in 1938 on 100 buds, from 12,900 buds inspected in 43 fields.

E. W. Dunnam, et al. (June 24): In Washington County on 3,912 seedling cotton plants, 66 nymphs were found, or 1.69 nymphs per 100 plants.

Louisiana. R. C. Gaines and assistants (June 24): In 34 fields in Madison Parish 26 adults were taken in 5,800 sweeps of the net.

Oklahoma. C. F. Stiles (June 21): Recent field examinations in southern and eastern Oklahoma show cotton flea hopper present in damaging numbers in all fields examined on black-land prairie.

Texas. F. L. Thomas (May 31): Numbers in cotton slowly increasing in southern Texas. Average infestation in central Texas well below danger point, although as high as 30 per 100 terminals were found in some fields of early planted cotton. Hatching of overwintered eggs increased remarkably during the last week. (June 7): Continuing to increase in southern Texas. Found causing considerable damage in 5 fields of the Robstown area. In other parts of Nueces County and in Calhoun County slight increases in population found but little injury apparent. In central Texas hatching of overwintered eggs decreased considerably. Total hatch prior to June 1 considerably below normal. In McLennan County examinations in 22 fields showed an average of 2 per 100



terminal buds. (June 12): Damage caused in fields near Robstown, Corpus Christi, Odem, and Gregory, in Nueces and San Patricio Counties. Increasing in Calhoun County and beginning to appear in injurious numbers in fields near Coupland and Taylor, Williamson County. Absent or in small numbers only in 18 fields examined in Austin, Bastrop, Burleson, Colorado, and Waller Counties.

K. F. Ewing and W. S. McGregor (June 3): In 22 cotton fields in McLennan County 3,700 terminals showed an average of 1.62 nymphs and 0.58 adult, or a total of 2.2 per 100 buds. (June 24): In McLennan and Falls Counties an average of 5.1 adults and 11.6 nymphs, or a total of 16.7 per 100 buds, found on 6,200 terminal buds examined in 16 fields. Average last week was 11.9 per 100 buds.

C. R. Parencia and S. E. Jones (June 3): Only a few fields injured in Calhoun County, despite an average of 10.2 adults and 27 nymphs per 100 buds on 5,200 terminal buds in 18 fields. Infestation found generally high on May 31 in the vicinity of Robstown and Corpus Christi, coastal bend area. (June 24): Inspection of 4,400 terminal buds in 9 fields in Calhoun County showed an average of 6.5 adults and 40.9 nymphs, per 100 buds, as compared with an average of 9.9 adults and 37.9 nymphs last week.

#### COTTON STAINER (Dysdercus suturellus H. S.)

Florida. L. C. Fife and C. S. Rude (June 3): Numerous in some old fields where stalks were not destroyed in Marion, Union, Alachua, Gilchrist, Putnam, and Lake Counties.

#### THRIPS (Thysanoptera)

Texas. F. L. Thomas (June 20): Practically all cotton in the vicinity of grainfields in north-central and northern Texas injured to some extent, owing to the occurrence of thrips. Last week cotton in north-central Texas had begun to recover from damage.

#### MISCELLANEOUS COTTON INSECTS

Arizona. T. P. Cassidy (June 13): Between May 25 and June 7 at Buckeye, seedling cotton on 35 acres was destroyed by three species. Tenebrionid beetles, Blapstinus spp., and ground bugs, Pangaeus bilineatus Say, reported as numerous in cotton and causing serious damage, when a brood of beet armyworms (Laphygma exigua Hbn.) hatched out and completely destroyed the stand on 35 acres and damaged the stands in several other fields.

FOREST AND SHADE-TREE INSECTS

CANKERWORMS (Geometridae)

Connecticut. P. Wallace (June 21): The fall cankerworm (Alseophila pomotaria Harr.) is relatively scarce, heavy feeding having been noticed in very limited areas in a few localities only.

New Jersey. M. D. Leonard (June 15): Spring and fall cankerworms not at all abundant at Ridgewood, and very little evidence of feeding on oak and maple noticed. Apparently about the same as last year, or even a lighter infestation.

C. H. Hoffmann (May 24): About an acre of woodland at Millburn showed heavy feeding by the spring cankerworm (Palaeocrita vernata Peck).

Ohio. T. H. Parks (June 21): Spring and fall cankerworms, which were so abundant during May, disappeared during the first week in June.

Indiana. J. J. Davis (June 21): Both fall and spring cankerworms very abundant in the northern half of the State, especially the northeastern area from Anderson north. Elms and untreated apples attacked most severely.

Iowa. H. E. Jaques (June): Noted in southern Iowa in Johnson, Washington, Clark, Wapello, and Decatur Counties.

Missouri. A. C. Burrill (June 25): Cankerworms webbing leaflets and feeding in scattered groups of two or three on tree-of-heaven in Jefferson City.

North Dakota. J. A. Munro (June 22): Spring cankerworms abundant in the vicinity of Minot. Lighter infestations at Park River, Grand Forks, and northwards.

Nebraska. M. H. Swenk (June 20): Report of some injury to shade trees by spring cankerworm received from Redwillow County on June 8.

ELM SPANWORM (Ennomos subsignarius Hbn.)

Connecticut. G. H. Plumb (June): Young larvae were found feeding on elm at Monroe on May 26. On June 14 larvae were spinning down from foliage and pupating. Stripping not nearly so extensive as in 1938; most larvae found around periphery of 1938 infestation center. As in 1938, tulip poplar was not attacked.

A GEOMETRID (Physostegania pustularia Guen.)

Pennsylvania. T. L. Guyton (June 17): Adults numerous in woodland at McAlisterville.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. H. L. Bailey (June 24): Generally less abundant than last year in most of the State. No defoliation noted in Orange and northern Windsor Counties, where infestation was severe in 1937-38. Heavy outbreak reported from Grafton, northern Windham County, and Chester, southern Windsor County.

Connecticut. P. Wallace (June 21): Caterpillars fairly common throughout New Haven and Litchfield Counties, but no serious defoliation noted. Not so abundant as last year.

New York. N. Y. State Coll. Agr. News Letter (June 12): In Delaware County, eastern New York, maple worms that have defoliated tremendous areas of hard maples on the mountain side have been feeding on cauliflower in several fields.

New York Herald Tribune (June 18): A severe outbreak in two widely separated areas of the State announced today. Observations indicate that considerable defoliation is present in the Harlem Valley section in the towns of Austerlitz, Hillsdale, and Chatham, and spotted outbreaks, where some defoliation appears, have been noted in Cortland, Chenango, Otsego, Oneida, Herkimer, and Schoharie Counties. Most severe part of outbreak in Delaware County, heavy defoliation being quite general over the entire county.

New Jersey. M. D. Leonard (June 15): Not at all abundant this spring at Ridgewood and very little evidence of feeding noticed on oak and maple.

Pennsylvania. T. L. Guyton (June 6): Causing defoliation in areas in Susquehanna County. Evident from Hop Bottom to New Milford to Montrose. Larvae seemed to be about full grown. In great clusters on trunks of maple, elm, and other forest and shade trees.

North Dakota. J. A. Munro (June 22): Very abundant in the vicinity of Elbowoods, McLean County, and the adjoining section of Dunn County.

Montana. H. B. Mills (June 12): Abundance on apple and shade trees at Bozeman slightly more than average. M. fragilis Stretch considerably more abundant on wild cherry and rose than usual in the Gallatin Valley.

Washington. S. M. Dohanian (June 15): Poplars, willows, hawthorns, wild apples, and several other species of trees growing in the swampy lands bordering on the Columbia River between Kalama and Longview, a distance of 8-10 miles, were entirely defoliated. Most of the larvae apparently full grown, and some had formed cocoons. Some trees on the west bank of the river (on the



Oregon side) were also defoliated, probably by the same pest.

W. W. Baker and B. J. Landis (June 16): Fairly abundant on apple near Puyallup, early in June, and most larvae had succumbed to disease by June 16. An occasional larva of M. disstria was found with M. pluvialis Dyar near Skykomish on June 11 and on Vashon Island late in May.

FALL WEBWORM (Hyphantria cunea Drury)

Connecticut. S. W. Bromley (June 24): First brood of fall webworm, H. textor Harr., unusually abundant in southwestern Connecticut.

Maryland. E. N. Cory (June 13): Young specimens of fall webworm noted on pear at Baltimore.

Georgia. O. I. Snapp (June 6): Nests of half-grown fall webworms on apple trees were observed at Fort Valley on June 6.

Tennessee. G. M. Bentley (June 20): Generally bad throughout the State. First appearance noticed early in June. Many reports received. Host plants varied, the predominating ones observed having been maple, sycamore, Lombardy poplar, elm, and mulberry.

Mississippi. C. Lyle (June 24): Reported as present on some fruit and forest trees in Clay, Lowndes, Neshoba, Oktibbeha, and Webster Counties; on pecan trees in Humphreys County and in the southeastern part of the State.

GYPSY MOTH (Eorthotria dispar L.)

Massachusetts. H. D. Leonard (June 20): On Cape Cod a heavy infestation reported, especially in the locality of Harwich. Larvae about three-fourths grown and control measures being applied.

VICEROY (Basilarchia archippus Cram.)

Minnesota. A. G. Ruggles and assistants (June 19): Moderately abundant on poplar at Minneapolis on May 14.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Pennsylvania. T. L. Guyton (June 20): Collected on sassafras in a forest near Laflin on June 14. (Det. by H. Morrison.)

PUTNAM'S SCALE (Aspidiotus ancylus Putn.)

Pennsylvania. S. W. Bromley (June 24): Found infesting Ohio buckeye in the Philadelphia area.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Maryland. E. N. Cory (June 7): Infesting privet at Baltimore.

Indiana. J. J. Davis (June 21): Killing branches of ash trees at La Fayette. The young had hatched when observed on June 16.

Nebraska. M. H. Swenk (June 20): American elm trees in Redwillow County reported as attacked on June 8.

PERIODICAL CICADA (Magicicada septendecim L.)

Pennsylvania. T. L. Guyton (June 21): On June 13 the presence of cicada noticed in moderate appearance on State Highway 83 between Schubert and Summit Station, near the crest of the mountain, probably in Schuylkill County. This is the only record for this year.

Maryland. E. N. Cory (June 15): One cast skin brought from near College Park on June 12; and it has been reported that there were many cast skins in an orchard at Hancock, the first being taken on June 9.

P. Knight (June): Periodical cicada records: At College Park, a cast skin; heard at Branchville, Beltsville, and near Plum Point; egg punctures observed at Beltsville and Chevy Chase. G. B. Vogt reports having heard the insect at Catonsville. All records on sound believed unquestionable as to identity.

Virginia. W. J. Schoene (June 19): Brood 13 heard in an orchard at Stuart, Patrick County, and at Grahams Forge, Wythe County; cast skins collected at both places. Also heard in an orchard  $2\frac{1}{2}$  miles northeast of Blacksburg, and there were 5 or 6 cast skins on each tree in this section of the orchard. Reported as heard in an orchard in the vicinity of Roanoke. (June 22): Three cast skins collected in an orchard about 1 mile south of Glenvar on June 20. A few specimens collected in an orchard several miles south of Chilhowie on June 21. Report of cicada cast skins as present during the last several weeks in considerable numbers in scrub land 2 or 3 miles east of Blacksburg.

A. M. Woodside (June 17): A few heard in Augusta County during the latter part of May, and two specimens captured.

Ohio. J. S. Houser (June 16): Songs of cicadas heard on June 8 at Brecksville, Cuyahoga County, and on June 14 at Canton, Stark County.

Indiana. J. J. Davis (June 21): Abundant in Lake, La Porte, and Porter Counties, in northwestern Indiana.

Illinois. W. P. Flint (June 20): The cicada appeared a little late, the first insects being seen or heard on May 29 and 30. Very general and abundant, covering the area of the State north of a line drawn approximately from Keokuk, Iowa, to Danville.

N. F. Howard (June 18): In the vicinity of Chicago Heights, not far from the Indiana line, the cicada was so abundant that the characteristic calls could be heard in an automobile. A specimen was taken in the city.

H. E. Painter (June 19): Heavy drumming along Federal Highway No. 30 between Chicago Heights and Plainfield on June 16.

Wisconsin. C. L. Fluke (June 24): In large numbers in Richland, Crawford, Rock, and Dodge Counties. Lesser numbers in all southern counties. Began emerging about June 1.

Iowa. C. J. Drake (May 31): Reported this morning as emerging in the eastern part of the State at Cedar Rapids, Linn County.

F. E. Krause (June 10): Fairly numerous in trees in Jackson County.

#### ASH

##### ARIZONA ASH TINGID (Leptotypha minor McA.)

California. C. S. Morley (June 12): Showing up and doing some injury to ash trees in Kern County.

#### BEECH

##### BEECH WOOLLY APHID (Phyllaphis fagi L.)

Connecticut. S. W. Bromley (June 24): Abundant as usual on ornamental beech trees, particularly purple and cut-leaf varieties, in the southwestern area.

#### BIRCH

##### BRONZED BIRCH BORER (Agrilus anxius Gory)

Indiana. J. J. Davis (June 21): Damaging trees at Indianapolis on June 17.

##### BIRCH LEAF MINER (Fenusa pumila Klug)

Ohio. J. S. Houser (June 2): Attacking white birch at Hudson.

#### APHIDS (Aphididae)

New Jersey. M. D. Leonard (May 29): A few alates of Calanpis betulaccolens Fitch found on birch at Ridgewood along with the much more abundant Eucoraphis betulae Koch.



CHOKECHERRY

CHOKECHERRY MIDGE (Contarinia virginianiae Felt)

Nebraska. M. H. Swenk (June 20): Report from Nemaha County on May 31 as infesting fruits of chokecherry.

BOXELDER

BOXELDER BUG (Leptocoris trivittatus Say)

Indiana. J. J. Davis (June 21): Immature bugs abundant on boxelder in the northern half of the State.

Nebraska. M. H. Swenk (June 20): Complaints of annoyance around trees and bushes and along sidewalks from Cedar and Douglas Counties on June 5 and 14, respectively.

Kansas. H. R. Bryson (June 24): Large numbers of young bugs found in and near Manhattan.

Utah. G. F. Knowlton (May 27): Extremely abundant in some places, nymphs being present in masses, varying in size from approximately one-fourth grown to nearly mature.

BOXELDER APHID (Periphyllus negundinis Thos.)

Utah. G. F. Knowlton (June 8): Extremely abundant on some trees at Riverton.

A LEAF ROLLER (Gracilaria sp.)

Utah. G. F. Knowlton (June 8): Boxelder leaf rollers are stripping boxelder trees at Holladay.

CATALPA

CATALPA SPHINX (Ceratonia catalpae Bdv.)

Maryland. Gertrude Myers (May 31): Larvae are appearing on the catalpa trees along Avery Road east of Rockville.

Ohio. E. W. Mendenhall (June 23): Making its appearance on catalpa in Columbus, Springfield, and central Ohio.

CYPRESS

A CYPRESS MINER (Argyresthia sp.)

Washington. W. W. Baker (June 16): Specimens of a cypress miner

collected on Monterey cypress at Point Defiance, were brought in early in May. The larvae were extremely abundant and feeding gave the trees a scorched appearance. Adults began to emerge about June 12.

ELM

ELM LEAF BEETLE (Galerucella xanthomelana Schr.)

Vermont. H. L. Bailey (June 24): First adult noted at Winooski, Chittenden County, northwestern area, on May 17. Eggs, newly hatched larvae, and adults noted at the same place on June 15. Infestation severe.

Connecticut. P. Wallace (June 21): Not at all common over most of the State.

New York. R. E. Horsey (June 20): A number of young larvae found on elms at Rochester, where it is a serious pest.

Pennsylvania. H. E. Hodskiss (June 22): Adults abundant in Philadelphia County on May 24. No eggs observed.

Maryland. E. N. Cory (June 8): On elm at Hagerstown.

Ohio. E. W. Mendenhall (June 23): Injurious on English and American elms in Worthington on street trees and private property.

Indiana. J. J. Davis (June 21): Defoliating elms at New Albany on June 15 when the larvae were nearly full grown.

Kentucky. W. A. Price (June 23): Larvae abundant on Chinese elms the first week of June at Lexington.

California. C. S. Morley (June 12): Has completely defoliated many untreated elm trees in Kern County.

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus Marshan)

Connecticut. P. Wallace (June 21): Much more abundant on elm in New Haven County than at any time since 1934.

NATIVE ELM BARK BEETLE (Hylurgopinus rufipes Eich.)

Connecticut. P. Wallace (June 21): Much more abundant in New Haven County on elm than at any time since 1934.

ELM FLEA BEETLE (Altica ulmi Woods)

Massachusetts. A. I. Bourne (June 27): W. B. Becker reports hibernating adults from eight localities in western Massachusetts.

Connecticut. S. W. Bromley (June 24): Reported from Lakeville in localized areas as causing more damage than elm leaf beetle.

ELM LEAF MINER (Fenusa ulmi Sund.)

Vermont. H. L. Bailey (June 24): Found abundant at Malletts Bay, Chittenden County, Champlain Valley, on American elm on June 15.

Connecticut. S. W. Bromley (June 24): Produced partial defoliation this month on red elms in the Stanford area.

WOOLLY ELM APHID (Eriosoma americanum Riley)

Massachusetts. A. I. Bourne (June 27): On elm leaves from Sherborn on June 15.

Maryland. E. N. Cory (May 31): On elm in Upper Marlboro.

North Dakota. J. A. Munro (June 22): Moderately abundant and generally distributed throughout the State.

Nebraska. M. H. Swenk (June 20): Attacking Chinese elm trees in Morrill County on June 16.

D. B. Whelan (June 6): Present at Lincoln where trees have been pruned.

WOOLLY APPLE APHID (Eriosoma lanigerum Hausn.)

Vermont. H. L. Bailey (June 24): Rosette aphid extremely abundant on American elm at Malletts Bay, Chittenden County, Champlain Valley, on June 15. Many rosettes forming on trees, and great numbers of winged adults on bark.

Tennessee. G. M. Bentley (June 20): Occurring on elms at Memphis, Shelby County, and Clinton, Anderson County, on May 25 and June 1, respectively.

Montana. H. B. Mills (June 12): Many elm trees in Bozeman badly injured. Fall migrants were exceptionally abundant last September.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Maryland. E. N. Cory (May 31): On elm at Walkersville.

Ohio. E. W. Mendenhall (June 13): Numerous on elm trees along streets in Springfield.

Indiana. J. J. Davis (June 21): Was abundant on elm throughout the central part of the State.



Iowa. H. E. Jaques (June): Noted in Jasper County.

Nebraska. M. H. Swenk (June 20): American elm trees in Cheyenne and Lincoln Counties reported as infested on June 3 and 9, respectively.

Idaho. R. A. Fisher (June 9): Many elm trees generally over the State severely damaged.

Utah. G. F. Knowlton (June 13): Is damaging trees at Salt Lake and Logan.

### HICKORY

#### HICKORY BARK BEETLE (Scolytus quadrispinosus Say)

Maryland. R. A. St. George (June 8): About 12 or 15 hickory trees containing broods in Bethesda are in a dead and dying condition. Some emergence already but most of brood in mature larval stage. Others as smaller larvae, or pupae, and maturing adults. A few trees with dead tops and their partially developed foliage on mid-crown with base normal. Some trees with their green tops only. Ambrosia beetles severely attacking parts of the trees. Located in Greenwich Forest area, the area about 5 years old. Cutting streets, excavating for cellars, and a prolonged deficit of rain may have helped weaken the trees so that they became attractive to the beetles.

#### HICKORY PHYLLOXERA (Phylloxera caryocaulis Fitch)

New York. R. E. Horsey (June 20): Abundant at Rochester on several native pignut and oval-fruited hickories. One large pignut had lost about half its leaves and was badly disfigured.

### LARCH

#### LARCH CASEBEARER (Coleophora laricella Hbn.)

Massachusetts. A. I. Bourne (June 27): W. B. Becker noted the insect on larch from Salisbury on May 15.

New York. R. E. Horsey (June 20): Considerable damage on several species of larch at Rochester.

#### LARCH SAWFLY (Lygaconematus crichsonii Htg.)

Pennsylvania. H. E. Hodgkiss (June 22): Larvae abundant in Lackawanna County.

#### WOOLLY LARCH APHID (Chermes strobilobius Kltb.)

New York. R. E. Horsey (June 20): More numerous than usual on several

species of larch at Rochester.

New Jersey. F. A. Soraci (June 5): A heavy infestation on one ornamental larch at Trenton. Tree about 10 years old and planted about 6 years ago.

Pennsylvania. C. C. Hill (June 6): Chermes sp. found on needles in considerable abundance on an ornamental larch tree at Carlisle.

#### LINDEN

##### LINDEN BORER (Saperda vestita Say)

New Jersey. S. W. Bromley (June 24): Extensive injury reported from Darlington.

#### THRIPS (Thysanoptera)

Vermont. H. L. Bailey (June 24): Thrips very abundant on basswood foliage at Colchester, Chittenden County, northwestern area, on June 9. Many leaves curling back from margins and turning black as result of damage to veins. High percentage of thrips had disappeared by June 15.

##### LINDEN WART GALL (Coccidomyia verrucicola O. S.)

Maryland. E. N. Cory (June 5): On linden in Baltimore.

#### MAPLE

##### MAPLE LEAF STEM BORER (Caulacampus acericaulis MacG.)

Massachusetts. A. I. Bourne (June 27): In sugar maple petioles from Worcester on June 9.

New York. S. W. Bromley (June 24): Received from Westchester County where it was reported as somewhat abundant.

New Jersey. T. H. Jones (May 25): Heavy damage on a maple at Morris Plains was indicated by fallen leaves and injured petioles.

##### AN APHID (Drepanaphis acerifoliae Thomas)

New York. M. D. Leonard (June 15): Several leaves of Acer rubrum with a few alates just starting young, observed on a single tree at Flushing on June 11 and 15.

##### COTTONY MAPLE SCALE (Fulvinaria vitis L.)

Indiana. J. J. Davis (June 21): More abundant than last year throughout northern part of the State and as far south as

Crawfordsville, in central Indiana. Most infestations in soft maple. One infestation showed great abundance on osage orange. Specimens received on June 19 were hatching.

Ohio. T. H. Parks (June 21): Quite abundant in several counties of the western area. Specimens received from Madison, Clark, Champaign, Mercer, Allen, and Defiance Counties.

FALSE COTTONY MAPLE SCALE (Pulvinaria acericola Walsh & Riley)

North Carolina. B. H. Wilford (June 9): Silver maple leaves heavily infested with female adults, egg masses, and newly hatched young brought in for identification. Reported that street and lawn trees in Lenoir are being badly attacked.

OAK

A TORTRICID (Argyrotoxa semipurpurana Hearf.)

New Jersey. T. H. Jones (May 24): Feeding on pin oak noted in an area near Morristown from which larvae were collected in 1938. Some of these larvae were reared and moths determined by A. Busck. (May 26): Report from Whippany about caterpillars on oaks. Investigations revealed the larvae, probably this species, common on approximately 2 acres of large oaks. Some trees showed noticeable feeding.

C. L. Griswold (May 26): Pin oak trees along a roadside at Florham Park for about  $\frac{1}{2}$  mile showed heavy feeding by what was possibly this tortricid.

PUBESCENT OAK KERMES (Kermes pubescens Börne)

Missouri. L. Haseman (June 24): Complaints and specimens of oak kermes received in the middle of June from southwestern, northwestern, and central parts of the State, indicating an unusual abundance.

Nebraska. M. H. Swenk (June 20): Bur oak kermes gall reported as damaging oak trees in Richardson County on June 10 and in Douglas County on June 12.

Oklahoma. F. A. Fenton (June 20): The oak scale, reported at Crescent, Logan County, Oklahoma City, Oklahoma County, and near Meeker, Lincoln County. Scales have checked to a very large extent terminal growth of oaks and are killing back the tips in many instances.

A GRACILARIID (Lithocolletis cincinnatiella Chambers)

North Carolina. B. H. Wilford (June 29): Several inquiries with



specimens of mined chestnut oak leaves were received from Gaston County during the latter part of June. Possibly the above species.

PINE

WHITE-PINE WEEVIL (Pissodes strobi Peck)

North Carolina. B. H. Wilford (June 23): Serious injury reported from Cataloochee section of the Great Smoky Mountains, National Park, where the white-pine weevil was infesting terminal shoots of white pine.

PITCH TWIG MOTH (Petrova comstockiana Fern.)

Massachusetts. W. B. Becker (June 27): Larvae in pitch pine twigs from South Dennis on May 8. (Det. by C. Heinrich.)

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Michigan. R. Hutson (June 24): Numerous in Detroit and Monroe. Adults now on wing.

PANDORA MOTH (Coloradia pandora Blake)

Wyoming. J. A. Beal (June 20): Adults abundant in heavily defoliated area of ponderosa pine 2 miles long on Highway No. 16 near Osage. Eggs abundant. Young larvae just hatching.

PINE SAWFLIES (Neodiprion spp.)

New Jersey. C. L. Griswold (May): Over 100 acres of red, Scotch, Austrian, and western yellow pines planted on private estates in Somerset County heavily infested with N. sertifera Geoff. in the order named. These areas sprayed by autogiro during the latter half of May.

Maryland. E. N. Cory (June 14): LeConte's sawfly, N. lecontei Fitch, was infesting pine at Leonardtown.

Ohio. J. S. Houser (May 31): A Scotch pine planting near Clyde rather seriously damaged by N. sertifera. Austrian pine in the same planting injured to a lesser extent. Several other localities in northern and western parts of the State in which the sawfly is found, notably Toledo and Lima. Nearly full-grown larvae of a pine sawfly, N. dyari Rohw., were causing damage to a pine planting (Pinus echinata) in one of the State forests near Bainbridge.

Michigan. E. J. MacAloney (May 31): Presence of early instar larvae of the red-headed pine sawfly (N. lecontei Fitch) is reported from Manistee National Forest. Several colonies of larvae observed on jack pine during the last few days in May.

PINE DARK APHID (Pinus strobi Htg.)

New York. R. E. Horsey (June 19): Brought in for identification. On a white pine and reported as a cause of the older needles dropping prematurely. Fairly common at Rochester.

Minnesota. A. G. Ruggles and assistants (June 19): Reported from Sturgeon Lake on white pine on May 23. Moderately abundant.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Massachusetts. W. B. Becker (June 27): On pine from four localities in the State.

Ohio. E. W. Mendenhall (June 16): Abundant on evergreens, especially on hemlock trees in Worthington, Franklin County.

Minnesota. A. G. Ruggles and assistants (June 19): Moderately abundant on Norway spruce and Scotch pine at Minneapolis on May 2.

Nebraska. M. H. Swenk (June 20): Black Hills spruce in Redwillow County reported as infested on June 7.

SCOTCH PINE LECANIUM (Toumeyella numismaticum P. & McD.)

Minnesota. A. G. Ruggles and assistants (June 19): Reported on May 30 as moderately abundant on Scotch pine.

SPRUCE

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Maine. J. V. Schaffner, Jr. (June 24): Observations in two localities indicate a slight recession in the intensity of the outbreak in comparison to previous years.

New Hampshire. J. V. Schaffner, Jr. (June 24): Heavy feeding and defoliation can be expected on Beech Hill, Dublin.

Vermont. H. L. Bailey (June 24): First- and a few second-instar larvae at Wilmington, Windham County, southern part of the State, on June 7. Tests by F. E. Miller showed a very high percentage of emergence from overwintered cocoons. Not over 1 percent unpupated, overwintered larvae remained at that date. Some fourth- and fifth-instar larvae at the same point on June 22.

W. F. Sellers (June): The center of the epidemic outbreak in Marlboro has moved eastward toward Brattleboro, continuing the progressively eastward movement of past generations. Heavy feeding and frass noted, and severe defoliation over large areas can be expected. This outbreak is the worst in the northeastern United States.

A SAWFLY (Neodiprion sp.)

Wisconsin. H. J. MacAloney (May 29): First and second instars of a sawfly were found on spruce in the Chequamegon National Forest today. Larvae numerous enough to be easily found even in these early instars.

SPRUCE NEEDLE MINERS (Lepidoptera)

Connecticut. J. V. Schaffner, Jr. (June 6): On the evening of June 5 adults of Epinotia nanana Treit. were abundant and hovering about ornamental blue spruce trees in Hamden, Conn., and on June 13 noted as abundant on blue spruce at Winchester, Mass.

Minnesota. A. G. Ruggles and assistants (June 19): Taniva albolineana Kearf. was moderately abundant on spruce at Minneapolis and at Mound on May 3 and 9, respectively.

A SPRUCE GALL MIDGE (Phytoptus sp.)

Wisconsin. H. J. MacAloney (May 29): Small galls of spruce gall midge at the bases of spruce leaves are common, but injury not severe on the Chequamegon National Forest. Adults were emerging on May 29.

SPRUCE RED SPIDER (Paratetranychus uniunguis Jacobi)

Pennsylvania. S. W. Bromley (June 24): Unusually abundant in the vicinity of Philadelphia.

Kentucky. W. A. Price (June 23): Unusually abundant in eastern and central Kentucky in May and early in June. It caused much damage to Norway spruces.

South Dakota. E. C. Severin (June 5): Very abundant and doing much damage to spruces in the eastern part of the State.

WILLOW

SPOTTED WILLOW LEAF BEETLE (Chrysomela lapponica L.)

Connecticut. M. P. Zappe (June 15): Many alders along streams at East Haven about 50-percent defoliated by this pest.

Ohio. T. H. Parks (June 21): Received almost daily with reports that it is defoliating willow.



Kentucky. W. A. Price (June 23): Caused some damage to willow trees in the vicinity of Independence.

Iowa. H. E. Jaques (June): This insect has nearly stripped the leaves from the willow trees in Skunk River Basin, Clarke County, mid-southern part of the State.

COTTONWOOD LEAF BEETLE (Chrysomela scripta F.)

Virginia. A. M. Woodside (June 17): Pussy willows near Staunton have been damaged by two beetles, one of which is believed to be the above species. The other may be the willow leaf beetle, Plagiodera versicolora Laich.

North Carolina. B. H. Wilford (June 9): Willow trees for the second successive year, along the Oconalufay River on the North Carolina side of the Great Sandy Mountains National Park badly damaged.

Ohio. J. S. Houser (June 2): Much more abundant in many localities in the State, and widespread in occurrence. It is damaging ornamental willows as well as trees along streams in woodlands.

POPLAR AND WILLOW BORER (Sternonchetus lapathi L.)

Missouri. L. Haseman (June 24): Second-brood adults present in great numbers on willows and poplars in central and northern Missouri since the middle of June.

Oregon. W. D. Edwards (June 20): Mature larvae and pupae found in pupal tunnels in willow, poplar, and birch at Portland.

IMPORTED WILLOW LEAF BEETLE (Plagiodera versicolora Laich.)

Connecticut. J. V. Schaffner, Jr. (June 7): Larvae were abundant in several localities in New Haven County, particularly in Waterbury.

GALL GNAT (Oligotrophus salicifolius Felt)

Nebraska. M. H. Swenk (June 20): Specimen of willow twig infested with the willow blister gall was received from Furnas County on June 17.

AN APHID (Chaitophorus viminalis Monell)

New Jersey. H. D. Leonard (June 15): Abundant on the undersides of leaves of many watersprouts of good-sized trees (Salix sp.) at Ridgewood, but alates not numerous. Honeydew abundant.

I N S E C T S   A F F E C T I N G   G R E E N H O U S E  
A N D   O R N A M E N T A L   P L A N T S

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Connecticut. J. P. Johnson (June): Overwintered adults very numerous on the site of an old infestation, numbering as high as 50 to 70 per square foot. Warm days and drought conditions favorable for their development.

Pennsylvania. H. E. Hodgkiss (June 22): Large numbers of adults observed in Philadelphia County on May 24. No eggs found.

A SOD WEBWORM (Crambus trisectus Walk.)

South Dakota. H. C. Severin (June 5): Found to be very abundant at Hot Springs, where caterpillars have been doing much damage to lawns.

A BEETLE (Dichromana sp.)

Arizona. C. D. Lebert (June 23): Larvae numerous in lawns during early June, and severe damage to several lawns observed. Adults taken around lights during the middle of June.

A SPIDER MITE (Paratetranychus ilicis McG.)

District of Columbia. L. G. Baumhofer (May 16): Specimens of spider mites taken from heavily infested parts of an ornamental hemlock tree in Spring Valley on May 15. Conspicuous webbing on and between needles, and considerable discoloration of the foliage. (Det. by E. A. McGregor.)

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

Maryland. E. N. Cory (June 15): Found at Pikesville attacking arborvitae.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Ohio. J. S. Houser (June 12): Infestation on arborvitae at Fort Jennings and Columbiana sufficiently heavy to cause damage. Eggs beginning to hatch.

BUTTERFLYBUSH

NEGRO BUG (Allocoris pulicaria Germ.)

Alabama. J. M. Robinson (June 19): Very abundant on butterflybush on June 12. (Det. by H. G. Barber.)

AZALEA

A WHITEFLY (Aleurodes azaleae B. & M.)

Maryland. F. F. Smith (April 28): Whitefly larvae, pupae, and emerging adults on leaves of azalea at Beltsville. (Det. by Louise M. Russell.)

AZALEA SCALE (Eriococcus azaleae Comst.)

New Jersey. E. G. Brewer (June 19): White scale on twig of azalea grown outdoors at Bloomfield. (Det. by H. Morrison.)

Ohio. J. S. Houser (June 21): Serious infestation of azalea bark louse on rhododendron at Cleveland required treatment. Young appearing today.

Mississippi. C. Lyle (June 24): A local infestation reported from Lauderdale County on June 22.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

Massachusetts. A. I. Bourne (June 27): On boxwood at Edgartown on June 6.

Maryland. E. N. Cory (June 5): Boxwood midge on boxwood.

BURNINGBUSH

A LEAF BEETLE (Calligrapha rhoda Knab)

Michigan. R. Hutson (June 24): Taken on burningbush in Holt and Big Rapids on May 25.

CHRYSANTHEMUM

CHRYSANTHEMUM LACEBUG (Corythucha marmorata Uhl.)

Mississippi. C. Lyle (June 24): Specimens received from Bolivar County on May 20. Feeding on chrysanthemum.

A LEAF BEETLE (Nodonota clypealis Horn)

Alabama. J. M. Robinson (June 21): On chrysanthemum at Guntersville on June 17.

DAHLIA

A LEAF BEETLE (Chaetocnema denticulata Ill.)

Maryland. H. L. Dozier and L. W. Saylor (June 4): Taken on dahlias, injuring the foliage of young plants, at Cambridge. (Det. by H. S. Barber.)



DELPHINIUM

AN APHID (Aphis rociadae Ckll.)

Nebraska. M. H. Swenk (June 20): Delphinium plants in Butler County reported as attacked on May 26.

COLUMBINE

COLUMBINE LEAF MINER (Phytomyza minuscula Gour.)

New Jersey. M. D. Leonard (June 15): Most of the older leaves on a number of columbine plants at Ridgewood badly mined by larvae on May 29. Situation about the same now.

AN APHID (Pergandeidia trirhoda Walk.)

New Jersey. M. D. Leonard (June 15): Alates in small numbers only on a number of columbine plants examined on May 29 at Ridgewood. Just starting to produce young. On May 30, 1938, these aphids were common on the same plants and young and adult apterae were numerous. Today alates present in about same numbers, but apterae present in small colonies on a few leaves.

HOLLY

A SCALE INSECT (Asterolecanium sp.)

Virginia. H. G. Walker and L. D. Anderson (June 26): A scale was reported by the county agent as rather seriously injuring holly at Newport News. It has also been observed attacking holly at Norfolk on several different occasions.

HONEYSUCKLE

AN APHID (Rhopalosiphum melliferum Hottes)

New Jersey. M. D. Leonard (June 15): A small bush honeysuckle at Ridgewood has many of the flower clusters heavily infested. Aphids also on the undersides of many of the leaves. Alates numerous.

JUNIPER AND CEDAR

A LEAF BEETLE (Colaspis sp.)

Louisiana. P. K. Harrison (June 15): Observed doing moderate to severe damage to Cedrus deodara at Baton Rouge.

A THRIPS (Scolothrips sp.)

Minnesota. A. G. Ruggles and assistants (June 19): Reported from Redwood Falls, as moderately abundant on cedar on May 13.

JUNIPER WEBWORM (Dichomeris marginellus F.)

Ohio. E. W. Mendenhall (June 15): Numerous on juniper trees in a nursery at Westerville, Franklin County.

Michigan. R. Hutson (June 24): Reported from Kalamazoo, Detroit, Monroe, and East Lansing,

BOYELDER BUG (Leptocoris trivittatus Say)

Nebraska. D. B. Whelan (June 20): On May 31 eggs in red cedar. More numerous than for several years past. One-half to nearly full grown by mid-June.

AN APHID (Cinara sabinæ Gill.)

Connecticut. S. W. Bromley (June 24): Red cedar aphid received from New Haven, where twigs are dying.

JUNIPER SCALE (Diaspis caruoli Targ.)

Michigan. R. Hutson (June 24): Reported on juniper from Fremont, Saranac, East Lansing, and South Haven.

Oklahoma. F. A. Fenton (June 20): Reported on juniper at Shawnee, Pottawatomie County.

Oregon. W. D. Edwards (June 20): Attacking arborvitæ, juniper, and cypress in the Willamette Valley. Crawling young mostly settled on June 20.

LILAC

LILAC BORER (Podosesia syringæ Harr.)

Minnesota. A. G. Ruggles and assistants (June 19): Reported from Ivanhoe as moderately abundant on lilac and oak on May 2.

LILY

A NOCTUID (Xanthopastis timais Cram.)

Mississippi. C. Lyle (June 24): Larvae received since June 12 from Carroll, Jefferson Davis, Neshoba, and Sunflower Counties on lilies and similar plants.

PRIVET

FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Florida. H. Spencer (June 12): Leaves of privet heavily infested with scales from Fort Pierce. (Det. by H. Morrison.)

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

New York. R. E. Horsey (June 20): A few lacebugs on rhododendron at Rochester.

New Jersey. M. D. Leonard (June 15): Sufficiently abundant on several large rhododendron plants at Ridgewood to necessitate control measures.

Maryland. E. N. Cory (June 16): Attacking rhododendron at Baltimore.

HOWARD'S SCALE (Aspidiotus howardi Ckll.)

New York. S. W. Bromley (June 24): Found infesting rhododendron foliage on Long Island. Infestation apparently not especially injurious.

ROSE

ROSE SAWFLY (Caliroa aethiops F.)

Missouri. A. C. Burrill (June 6): Occasional rose bushes were badly damaged in Cole, Osage, Gasconade, Franklin, Maries, and Phelps Counties. Hardy memorial roses practically untouched so that it is evident that the epidemic is limited to the older species or varieties of roses. This inspection covers an area about 75 by 65 miles and indicates a general epidemic.

Nebraska. M. H. Swenk (June 20): Specimens of rose leaves and twigs showing injury by the European rose slug received from Thayer, Saline, and Frontier Counties on June 5, 9, and 17, respectively.

ROSE CURCULIO (Rhynchites bicolor F.)

Nebraska. M. H. Swenk (June 20): Found attacking roses in Keyapaha County.

Utah. G. F. Knowlton (May 30): Rose snout beetles infesting and injuring buds of cultivated, as well as wild roses, at Logan and Hyrum. (June 15): Damaging roses at Salt Lake City.

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (June 15): Not abundant at Ridgewood on May 29 on a number of rose bushes and vines examined. Today almost no aphids present on these plants.

New York. M. D. Leonard (June 20): On June 5, a number of rose bushes in Jackson Heights moderately infested. Situation about the same now to even a less infestation.



Nebraska. D. B. Whelan (June 20): Quite common in rose gardens at Lincoln from late in May until the middle of June.

A GALL WASP (Rhodites dichlocerus Harr.)

Nebraska. M. H. Swenk (June 20): Report of the long nose gall received from Washington County on May,

SPIREA

GREEN CITRUS APHID (Aphis spiraeicola Patch)

New York. M. D. Leonard (June 20): A number of shrubs of spirea at Jackson Heights only moderately infested.

New Jersey. M. D. Leonard (June 15): On May 29 many terminal shoots of several shrubs at Ridgewood were well infested, but this aphid was by no means really abundant. Today it seemed it is less numerous on the same shrubs.

Tennessee. G. M. Bentley (June 20): Infestation of spiraea aphid heavier than usual in the localities of Smithville, De Kalb County, and Nashville, Davidson County on May 20 and 22.

WATERLILIES

A SNOUT BEETLE (Bagous americanus Lec.)

Pennsylvania. J. O. Pepper (June 8): Snout beetle injuring blooms of waterlilies at State College. (Det. by L. L. Buchanan.)

WISTERIA

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Virginia. F. W. Poos (June 5): Severe burning of tips by adults and nymphs on pink wisteria, Wisteria multijuga rosae, whereas on W. sinensis, nearby, both nymphs and adults occurred but not abundantly enough to cause burning of leaves. The same observation was made on these plants in August 1938. (Det. by Nancy H. Wheeler.)

I N S E C T S   A T T A C K I N G   M A N   A N D  
D O M E S T I C   A N I M A L S

MAN

EYE GNATS (Hippelates spp.)

Georgia. A. L. Brody and E. E. Rogers (June 21): Tremendous increase in numbers at Valdosta during the last month. Working outdoors exceedingly annoying owing to the clusters of gnats around face and eyes.

FLIES (Diptera)

Georgia. T. L. Bissell (June 13): On May 30 at Williamson, central Georgia, eyes of three people infested with some minute maggots. About 15 maggots removed from their eyes. Only one specimen saved, which was a dipterous larva, but no closer determination possible.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith and F. C. Bishopp (June): Adults present in great numbers on the island of Marthas Vineyard and on the adjacent mainland of Cape Cod. A few cases of spotted fever again on Cape Cod, and a few cases of tick paralysis in dogs. Ticks reported as much worse than ever before at Centerville. At Plymouth, near the northern limit of this species in Massachusetts, reported as abundant this year. Said to be unusually abundant in the vicinity of Duxbury and reported as far north as Scituate. Reports from that area indicate a few ticks present 3 years ago, worse last year, and showing a greater increase this year.

Maryland. E. N. Cory (June 24): Observed on lawns and at resorts in Garrett, Allegany, and Baltimore Counties.

Virginia. F. C. Bishopp (June): Two males submitted from Albemarle County, which adds another county to the authentic records of distribution in Virginia. (Det. by Helen L. Trembley.)

Georgia. T. L. Bissell (June 13): Very abundant during May.

J. Krafka (June 19): At Augusta tick removed from the head of a child in whom it had produced so-called tick paralysis. (Det. by H. E. Ewing.)

E. E. Rogers (June 21): Both males and engorging females found on animals at Valdosta in small numbers during the month. Four ticks taken from a bear killed near the Okefenokee Swamp.

ROCKY MOUNTAIN SPOTTED FEVER TICK (Dermacentor andersoni Stiles)

Nebraska. H. O. Schroeder (May): Ticks collected from various hosts in Fort Robinson included D. andersoni and D. variabilis. (Det. by F. C. Bishopp.)

Utah. G. F. Knowlton (June 10): Several Rocky Mountain spotted fever ticks collected during June, but less frequently than in May.

TROPICAL RAT MITE (Liponyssus bacoti Hirst)

Virginia. M. G. Perrow (June 15): Found in house at Lynchburg on June 5, where it was attacking a baby. (Det. by H. E. Ewing.)

CATTLE

SCREWWORM (Cochliomyia americana C. & P.)

Georgia. E. E. Rogers (June 21): Since May 29, 23 infestations found on animals at Valdosta.

A. L. Brody (June 14): Natural infestation in two dogs reported on June 11 and 14 at Valdosta.

Texas. R. Melvin (May 30): Population building up rapidly at Menard.

D. C. Parman (May): Flies apparently decreasing in the southern Texas Gulf coast region about May 15. In the area south-east of Del Rio flies increased from May 16 to 31. In the vicinity of Uvalde no change in population apparent between May 16 and 31.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody and E. E. Rogers (June 21): During the first week of June at Valdosta animals infested with about two to three hundred. At present the number per animal has decreased to about 100.

Texas. W. G. Bruce (May): Infestations of cattle in the vicinity of Fort Worth observed in excess of 3,500 flies per animal.

NORTHERN CATTLE GRUB (Hypoderma bovis Deg.)

Minnesota. A. G. Ruggles and assistants (June 19): Two larvae found in cows at Finlayson on May 9. (Det. by H. T. Peters.)

LONG-NOSED CATTLE LOUSE (Linognathus vituli L.)

Nebraska. M. H. Swenk (June 20): Found infesting calves in Garden County on June 6.



GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. E. E. Rogers (June 21): Increasing at Valdosta during the last month. Most individuals collected were males, and only a few females observed. One taken from a bear near Okefenokee Swamp.

HORSE

STABLEFLY (Stomoxys calcitrans L.)

Georgia. E. E. Rogers (June 21): Increasing at Valdosta during the last month.

Nebraska. M. H. Swenk (June 20): Abundance reported from Chase, Butler, and Jefferson Counties on June 10, 14, and 16, respectively.

Kansas. H. R. Bryson (June 24): Causing considerable annoyance to livestock in pastures and barns.

HORSE FLIES (Tabanus spp.)

Virginia. F. C. Bishopp (June): Two or more species reported as very abundant and annoying livestock at Culpeper; much worse than in the last few years.

NOSE BOTFLY (Gasterophilus haemorrhoidalis L.)

Nebraska. H. O. Schroeder (May 30): Adults active at Fort Robinson on May 15 and quite common by May 21. So numerous by May 30 that herds practically stopped grazing when flies were most active. Evidence of adult activity seen among farm horses through the western two-thirds of the State. Adult activity apparently started about 2 weeks earlier than last year.

DEER FLIES (Chrysops spp.)

Massachusetts. C. N. Smith and F. C. Bishopp (June): Causing annoyance to horses on Marthas Vineyard and on Cape Cod. At Greenbush found to be very abundant and annoying.

Maryland. Gertrude Myers (June 5): C. niger Macq. collected while biting man and horses at Rockville on June 4. (Det. by A. Stone.)

Utah. G. F. Knowlton (May 30): C. discalis Will. and C. fulvastra O. S. extremely abundant and annoying south of Penrose and on the Utah public shooting grounds. Man attacked vigorously in marshy areas. (June 5): C. discalis found to be annoying man and horses in fields west of Layton.

### BLACK GNATS (Simuliidae)

Nebraska. H. O. Schroeder (May 16): About 20 Leptoconops kerteszi americanus Carter collected at Sutherland, 100 more swarming around. Platte River bed about 100 yards distant. Also irrigation ditches in the vicinity. Reported as bad every spring. (Det. by A. Stone.) (May 30): On May 22 about 15 Simulium bivittatum Mall. collected from horses grazing near a small irrigation canal at Fort Robinson. Canal found heavily infested with immature stages. All horses in pastures adjoining this canal had wounds caused by the pest.

### POULTRY

#### CHICKEN MITE (Dermanyssus gallinae Deg.)

Nebraska. M. H. Swenk (June 20): Request for control information received from Douglas County on May 31.

### BEAVER

#### BEAVER BEETLE (Platypsylla castoris Rits.)

Minnesota. A. G. Ruggles and assistants (June 19): Reported on beaver from the eastern part of Minnesota in May. (Det. by C. E. Mickel.)

### HOUSEHOLD AND STORED-PRODUCTS INSECTS

#### A TERMITE (Reticulitermes flavipes Koll.)

Minnesota. A. G. Ruggles and assistants (June 19): Reported from Luverne on May 5. Winged adults abundant on May 5. (Det. by Emerson and Snyder.)

### ANTS (Formicidae)

Maryland. H. L. Dozier and L. W. Saylor (June 4): Tetramorium caespitum L. and Monomorium minimum Buckl. taken on dahlia at Cambridge. Injuring foliage of young plants. Ants were feeding along the midrib starting near the base of the leaf blade.

Florida. G. B. Merrill (June 24): Wasmannia auropunctata Roger taken by State Plant Board inspectors at Royal Palm State Park, February 5. (Det. by M. R. Smith.)

Mississippi. C. Lyle (June 24): Fire ants, Solenopsis xyloni McCook, unusually numerous in Oktibbeha County. Reports of infested gardens and flower beds received from Bolivar, Carroll, Chickasaw, Harrison, Holmes, Leflore, Pearl River, and Sunflower Counties. Reports of injury received from the southeastern part of the State. The Argentine ant (Iridomyrmex humilis Mayr) was reported as a pest in

some houses in Holmes, Monroe, Montgomery, Pike, and Yazoo Counties, as well as in southwestern part of the State, during the last week in May and the first two weeks in June. Specimens of Crematogaster lineolata Say reported as being numerous in a house and on trees and fences in Tallahatchie County. Specimens received on May 22.

Oklahoma. F. A. Fenton (June 20): The red harvester ant (Pogonomyrmex barbatus F. Smith) reported from Clinton, Custer County.

L. B. Ray (June 12): Ants, Solenopsis xyloni, were sent in by Ray from Edmond, June 5. Infesting gardens and houses.

Texas. R. K. Fletcher (June 22): Red harvester ant reported in Castro County on May 22, and in Bexar County on June 16.

Nebraska. M. H. Swenk (June 20): Western harvester ant (P. occidentalis Cress.) reported as making disfiguring hills in a yard in Hitchcock County on May 25. Specimens of the basement ant, Lasius interjectus Mayr, were sent from Douglas County on June 13. Found under cement walk, as well as along the wall of cement blocks in the basement of a house. On May 23 common black garden ant, Formica fusca L., was reported as very abundant in a Custer County garden, especially among the strawberry roots.

Arizona. E. R. Tinkham (March 30): A small black ant about  $\frac{1}{4}$  inch long, in order to get at the honey glands of peach on the inside walls of the receptacle, snipped off about half the anthers at their bases and then removed the pistil and ovary completely. J. H. Hale variety with small flowers suffered greatest damage. Control measures saved the greater part of the peach crop from being destroyed. Larger varieties such as Elberta and Mayflower with large blossoms and heavier ovaries and pistils, were not severely injured.

#### WHARF BORER (Nacerda melanura L.)

Massachusetts. A. I. Bourne (June 24): Specimens of the wharf borer were collected in timber in the cellar of a building in Boston.

#### DRUG STORE WEEVIL (Stegobium paniceum L.)

New York. R. E. Horsey (June): A number of the weevils found in herbarium specimens in a herbarium at Rochester. (Det. by P. A. Radio, of Ithaca.) Larvae believed to be from the same, did considerable damage to dried specimens of trees and shrubs. As many as 15 larvae found in one flower cluster. They also ate cover papers, mounting cards, young leaves and stems, as well as dried fruits. Noted for the first time last winter, 1938-39.



A FLOUR BEETLE (Tribolium madens Charp.)

Nebraska. M. H. Swenk (June 20): A new stored-grain pest for this State was noted when specimens were sent in from Kearney County on May 26 with the statement that they were damaging stored wheat.

A CERAMEYCID (Xylotrechus sagittatus Germ.)

Massachusetts: W. B. Becker (June 27): In pine box lumber logged and made into boxes in central part of the State. (Det. by A. G. Bovins.) Similar larvae reported as having bored through paper which was packed inside other boxes made from this lumber.

A CLOTHES MOTH (Tineola walsinghami Busck)

Florida. J. R. Watson (June 21): Sent in from various parts of the State.

CAMEL CRICKETS (Tettigoniidae)

Nebraska. M. H. Swenk (June 20): Crickets, chiefly Ceuthophilus pallidus Thos. and Udopsylla robusta Hald. have again developed in super-normal abundance in some sections of the State. In Lancaster County the former was found abundantly infesting basements of houses at Lincoln.

A WOOD-ROACH (Parcoblatta pennsylvanica Deg.)

Minnesota. A. G. Ruggles and assistants (June 19): Reported from Anoka on May 10 as bothering people in a house on the river. (Det. by H. H. Shepard.)



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**BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING**





# INSECT PEST SURVEY BULLETIN

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## THE MORE IMPORTANT RECORDS FOR JULY

By the third week in the month general control operations for the control of the long-winged grasshopper was completed in Colorado and Oklahoma, the work in New Mexico and Texas having been completed about a week earlier. Clean-up work, however, on egg-laying concentration areas will be continued throughout the season. Control was so successful as to prevent important flights. Control work in the northern Great Plains is practically completed. The populations are shifting from harvested fields and considerable damage is being done to fall crops. Losses from flights, however, do not compare with those of last season.

A colony of European earwig discovered at New Haven, Conn., last year became apparently thoroughly established. In the Pacific Northwest this insect is much more numerous than last year.

Heavy populations of June beetles are reported from the northern part of the Eastern Shore of Maryland and from southern Virginia.

The Japanese beetle is becoming more seriously abundant in the rural areas of Connecticut and this year was reported for the first time attacking shade-grown tobacco. Southern New York, northern Maryland, and the Eastern Shores of Maryland and Virginia also report considerable defoliation of ornamental shrubbery and trees and spotted damage to agricultural crops.

The beet webworm was reported as doing some damage in North Dakota and Nebraska, with heavy flights of moths early in the month. The sugar beet crop in Utah County, Utah, is much more heavily infested than in previous seasons.

The chinch bug caused local damage in several counties in Indiana, in local areas in Illinois, and in southern Michigan and Wisconsin. A potential outbreak in Iowa was relieved by timely rain. Less extensive infestations were reported from Missouri and Nebraska.

In the Mississippi Valley as far northward as Wisconsin, Minnesota, and South Dakota corn ear worm seems to be abnormally abundant.

European corn borer seriously abundant in Connecticut, southeastern New York, and central New Jersey. The insect is apparently increasing in eastern Indiana and a survey conducted late in July showed 7 infested counties in Wisconsin.

The most general outbreak of the fall armyworm reported in several years was occurring in Mississippi. A minor infestation was reported from Georgia.

Pea aphid was very abundant in Maine and locally in New York did considerable damage. In Wisconsin the populations were low. In Washington State heavy damage was reported from the Centralia district in the western part.

The vetch bruchid is now known to occur in the six northern counties of the Willamette Valley of Oregon and in four counties immediately adjacent to this area in Washington State.

Blister beetles are generally abundant and doing considerable damage over limited areas throughout the upper Mississippi and Great Basin States. This abundance is probably associated with the large numbers of grasshoppers in these areas.

Corn ear worm is reported as damaging tomatoes over a wide area extending from South Carolina northward and westward to Indiana and Nebraska, also in Benton County, Wash.

Heavy infestation of barreled and sacked potatoes on the Eastern Shore of Virginia by the potato tuber moth was reported during the middle of the month.

An outbreak of a disease closely associated with western aster yellows is occurring on potatoes in western New York. This disease is supposed to be transmitted by the six-spotted leafhopper.

The cabbage weevil (Ceutorhynchus assimilis Gyll.) was collected in several localities in Washington for the first time. It is recorded from Pacific, Clark, Lewis, Cowlitz, Thurston, Pierce, Clallam, Whatcom, Skagit, and Grays Harbor Counties.

Heavy infestations of onions by the onion thrips were reported from New York, Connecticut, and Washington State.

Fuller's rose beetle was reported as seriously infesting pimiento peppers in central Georgia.

The codling moth did considerable damage in the Hudson River Valley of New York State and in Delaware. Injurious numbers were also reported from Virginia, Indiana, and westward to Minnesota.

Heavy infestations of aphids on apples are reported from Maine, New York, and Virginia.

Heavy infestation of Georgia Belle and Elberta peaches by second-generation plum curculio larvae is reported from central Georgia. A similar heavy infestation is reported from Mississippi. Considerable damage is also reported from Texas.

More damage by the raspberry fruitworm than ever before recorded was observed this year around Minneapolis and Saint Paul, Minn. Heavy damage is also reported from Michigan.

Although reported as doing considerable damage in some localities, the boll weevil as a whole does not appear to be more abundant than at this time last year.



During May the forest tent caterpillar defoliated extensive stands of willow along the northern bank of the Columbia River in Washington State, and in southeastern Oregon an infestation in Coos County was attracting attention. The western tent caterpillar (Malacosoma pluvialis Dyar) occurred in outbreak numbers in the Puget Sound region of Washington State, heavily defoliating alder and a number of other small trees, including some cultivated fruits. A less serious outbreak of this insect occurred in Linn County, Oreg.

An epidemic of the Great Basin tent caterpillar (Malacosoma fragilis Strotch) reappeared in the Deschutes National Forest of Oregon after a lapse of nearly 10 years. This insect defoliates bitterbrush, an important range plant in that region.

The fall webworm was generally abundant throughout the New England and Middle Atlantic States and southward to Georgia and Mississippi.

The Douglas-fir beetle was present in destructive numbers in parts of Idaho and Oregon. In the Shot Gun Valley of Oregon a large percentage of Douglas-fir has been destroyed during the last 3 years.

Dog ticks have been unusually abundant this season, and have remained so later than in recent years in the New England and Middle Atlantic States and parts of Wisconsin.

A caterpillar, Pseudohazis sp., probably P. hera Harr., has practically defoliated the snowberry bushes over approximately 150,000 acres in Minidoka National Forest in Idaho.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

General. B. M. Gaddis (July 7): Most of the lesser migratory hoppers (Melanopl mexicanus Sauss.) have reached the adult stage and the rest are rapidly maturing. In the southern half of this species' range eggs are being laid. Concentration in crops becoming general from areas in eastern Montana and Wyoming, from western Nebraska and the Dakotas, and in eastern Colorado and southwestern Kansas. Populations on idle and abandoned lands dwindling. (July 13): Flights have recently been general in the Northern Great Plains area, but have been moderate and crop destruction is light. Up to July 8 no definite reports of large swarms as invading new territory nor of serious crop losses from migrations in Montana and North Dakota. (July 19): Populations so reduced that control operations are no longer justified. Populations shifting daily, particularly from harvested fields, with concentrations on the more succulent crops, such as corn, and considerable damage in local areas. Losses from flights do not compare with those of last season. Oviposition just starting and potential flights may be stopped on this account, thus possibly causing heavier damage in local areas than has resulted from the hitherto shifting of populations. Hoppers now largely in the adult stage. (July 7): Control operations for the long-winged migratory grasshopper (Dissosteira longipennis Thos.) continuing in Colorado along the northeastern border of New Mexico and in Lincoln County, to be complete about mid-July. No extensive flights reported. Remaining adults thinly scattered, with little tendency to band together. (July 13): In Texas Panhandle rarely found exceeding 2 or 3 per square yard, where formerly they numbered hundreds per square yard. Control work practically completed in New Mexico, along the Colorado-New Mexico border, in the Oklahoma Panhandle, and in southeastern Kansas. Work reduced in Colorado, to be finished in a short time. Flights of a minor local character reported recently in New Mexico, originating apparently in an isolated, inaccessible mountainous area on the Colorado-New Mexico border. (July 19): Control operations in Colorado and Oklahoma discontinued the middle of July. Control in Colorado complete up to 85 to 90 percent. Work in Kansas to be finished by the end of this week. Remaining hoppers so scattered as to preclude economic control. Control so successful as to prevent consequential flights and to bring them down to noneconomic proportions.

Indiana. J. J. Davis (July 22): Unusually abundant in some areas, especially in northern Indiana. In a 200-acre orchard at Elkhart young hoppers were very numerous in the alfalfa cover crop, migrating to trees and seriously damaging peach fruits.

Wisconsin. E. L. Chambers (July 24): Wet, cold weather in the northwestern part of the State, where grasshoppers were expected to be most serious from the fall egg survey, kept the grasshoppers well in check until mid-July, when the red-legged species (M. femur-rubrum Deg.) began to hatch. Now threatening corn, sugarbeets, tobacco, and emergency hay crops in this area, as well as in about six counties in the east-central part of the State.



- Missouri. L. Haseman (July 25): Considerable control operations being conducted in southeastern and south-central Missouri, with less in other parts of the State. Apparently a rather heavy second brood of M. mexicanus is evident in southern Missouri.
- Minnesota. A. G. Ruggles and assistants (July 20): Some flights of grasshoppers taking place in the Red River Valley on July 9 and 10. Losses held to less than 3 percent through timely application of control measures.
- Kansas. H. R. Bryson (July 25): Grasshoppers not abundant in the eastern half of the State but are abundant in the west-central and southwestern counties.
- Nebraska. M. H. Swenk (July 15): Reports of damage to field crops received from June 21 to July 15 from all parts of the State. Report from Perkins County of the bark and needles of pine trees being damaged. Specimens received from Cass County, killed by a fungus. Several reports of heavy infestation with larvae of the flesh fly (Sarcophaga kellyi Ald.) received from central Nebraska counties in July. Report from Antelope County indicated that Eutrombidium trigonum Hermann is attacking grasshoppers.
- Iowa. H. E. Jaques (July): Infestation concentrated in western Iowa, with scattered infestation in central and eastern parts of the State.
- North Dakota. J. A. Munro (July 20): Injury to early crops apparently light, as compared to 1938. Possibility yet of severe injury to flax, potatoes, and other later maturing crops in localized areas. Control campaign throughout the State largely successful. M. mexicanus is the predominating species and commonly in flight on days when temperatures range above 85° F. Natural enemies of eggs, including bee flies and blister beetles, generally abundant.
- Utah. G. F. Knowlton (July 18): Outbreaks in many counties, scattered throughout the State, are menacing crops more seriously than last year.
- Georgia. D. F. Farlinger (July 20): Moderate to severe outbreaks of Schistocerca americana Drury in Randolph, Sumter, Houston, Wilkes, McDuffie, and Washington Counties. Feeding on corn, cotton, peanuts, sorghum, and Johnson grass. Severe injury in limited areas. Emerging from grain stubble fields. All known outbreaks treated.
- O. I. Snapp (July 18): Considerable damage to corn and cotton, chiefly the former, at Fort Valley, Perry, Byron, and other central Georgia localities during the period June 27 to July 18. Corn damaged especially where adjoining grain fields, plowed after harvest of the crop, thus driving insects from these fields. Infestation sufficient on most farms to warrant use of control measures.

MORMON CRICKET (Anabrus simplex Hald.)

- Utah. C. J. Sorenson (July 18): Very abundant in West Tintic and Sheeprock Mountains and in the foothills of Juab and Tooele Counties. They seriously threatened but did only minor damage to crops on scattered dry-land farms and ranches. Cooperative control program successful in preventing serious damage to crops and range forage.



EUROPEAN EARWIG (Forficula auricularia L.)

- Connecticut. J. V. Schaffner, Jr. (July 24): Found in 1938 in a garden at New Haven. Five traps recently put in this garden and on the first examination of the traps 156 earwigs were found.
- Rhode Island. A. E. Stene (July 19): A little above average in abundance in Newport County. Bait and several consignments of parasites being distributed.
- Idaho. C. W. Getzendaner (July 20): A considerable increase in numbers over last year noted at Moscow.
- Utah. G. F. Knowlton and F. C. Harmston (July 3): Seriously infesting ripening apricots at Farmington.
- Washington. E. W. Jones (July 10): Infestations at Walla Walla increased this year. Practically all of this year's brood have reached the adult stage.
- C. W. Getzendaner (July 20): A considerable increase in numbers over last year noted at Puyallup, Bellingham, Everett, Walla Walla, Pullman, Yakima, Ellensburg, Tacoma, Auburn, Hoquiam, and South Bend. Found moderately abundant at Port Townsend on July 14, and found at Pasco on July 8.
- Oregon. G. F. Knowlton (July 14): Specimens taken on the Columbia River Highway on June 20, at Bandon, on June 22, and at Woodburn on June 21.

WHITE GRUBS (Phyllophaga spp.)

- Maryland. E. N. Cory (July 20): Heavy infestation of adults on oak and pecan on the upper end of the Eastern Shore.
- Virginia. C. R. Willey and F. R. Freund (July): Specimens of May beetles (probably P. fervida F.) brought in from Henrico County on July 5. Found in a cornfield at night, 10 to 15 beetles on each stalk eating edges of leaves. Specimens from Chesterfield County, feeding on elm and roses. On July 6, 100 beetles collected from 1 rose bush. Specimens from Chesterfield County 3 miles south of Richmond on July 10, where they had stripped apples, pears and peaches of foliage, also feeding on rose, pecan, and crapemyrtle. Specimens from Lester Manor, King William County, found feeding, particularly on roses, on July 12. Other specimens from Atlee, Ashland, and Fredericksburg.
- Indiana. J. J. Davis (July 22): Less destructive than usual in the strawberry section near Borden and Pekin. Based on collections and rearings, P. ephilida Say, P. quercus Knoch, and P. hirticula Knoch were apparently the species largely responsible for damage in 1938.
- Minnesota. A. G. Ruggles and assistants (July 20): P. rugosa Melsh. and P. fusca Froel., Brood A, very abundant on corn and barley at Hammond, Wabasha County.

GREEN JUNE BEETLE (Cotinis nitida L.)

Virginia. A. M. Woodside (July 22): Very common in codling moth bait pails in Augusta County.

H. G. Walker and L. D. Anderson (July 27): Unusually abundant around several homes and at several golf courses at Norfolk during the last 3 weeks.

Ohio. N. F. Howard (July 6): Adults very numerous at South Point.

Kentucky. W. A. Price (July): Beetles began flying the first week in July and, by the middle of the month, were causing some damage to tomatoes, peaches, apples, blackberries, and corn in the vicinity of Lexington.

JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. J. P. Johnson (July 24): Larger city infestations have grown to such an extent that considerable defoliation is occurring. Also spreading into the semiurban and rural sections.

A. W. Morrill, Jr. (July 17): Present in such abundance in the Windsor area that many calls have been received. Reported today in a new location. Two tents of shade-grown tobacco found, where the plants were liberally sprinkled with adults and where many leaves showed evidence of feeding. Also observed feeding. In one instance dirt hauled in to fill a wash came from a sod patch, where a good-sized emergence was found on smartweed. Nearby wild grapes also found attacked. In the other instance, infestation apparently from witchgrass, growing along the edge of the field, which was said to have covered the lot last year, when sun-grown tobacco was raised there. So far as known, this is the first record of its kind.

New York. E. P. Felt (July 22): Extremely numerous in parts of Westchester County and also on western Long Island. Distribution and consequent damage are spotted.

M. D. Leonard (July 21): First observed at Flushing about July 1, although possibly present a few days prior to that date. Fairly abundant now, and peak of emergence apparently reached. Amount of feeding greatly reduced by control measures. Light to rather severe damage observed.

N. Y. State Coll. Agr. News Letter (July 10): First found near Kingston, Ulster County, in 1938, and now beginning to emerge. First adults observed on July 5. (July 24): Causing considerable damage in Westchester County. Formerly confined to shade trees and shrubs, but now attacking sweet corn and orchards.

New Jersey. M. D. Leonard (July 6): Beetles producing light feeding on a number of sassafras bushes examined at Ridgewood, Bergen County, northern New Jersey. No other plants attacked, so far as could be observed.

C. W. Collins (July 19): Abundance continues to increase each year around Morristown.



Delaware. L. A. Stearns (July 22): Infestation now at its height for the season. Rather spotty and somewhat less severe in general in New Castle County, northern Delaware, than in 1938, but much more serious in Kent County, central Delaware. Considerable damage to potato observed on one farm.

Virginia. H. G. Walker and L. D. Anderson (July 27): Much more abundant in the Norfolk area and on the Eastern Shore of Virginia than last year. Injury to ornamental plants in Norfolk. Trapping records at Norfolk show 266 beetles caught in 24 traps this year, as compared with 109 beetles for the entire season last year.

H. C. Donohoe (July 15): Current infestation most severe on the Eastern Shore, with the greatest noted intensity in and near Cape Charles, Hallwood, and New Church. Considerable defoliation of ornamental shrubbery and trees, and some feeding on corn, beans, and sweetpotato reported. Sharp decline in abundance started about July 10, and beetles now generally disappearing.

#### ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. J. P. Johnson (July 20): Report and a few adult specimens received from a grower of sweet corn in southwestern Connecticut. Investigation revealed that corn seedlings, 4 to 6 inches tall, had been killed, caused by the grubs feeding on the roots. Field in sod last year. Thousands of emergence holes observed. Field approximately 4 acres in extent, and about half the crop lost, owing to grub damage.

New York. N. Y. State Coll. Agr. News Letter (July 17): Destructive to young cabbage plants and Japanese lantern in a few localities on Long Island.

#### BUMBLE FLOWER BEETLE (Euphoria inda L.)

Virginia. C. R. Willey and F. R. Freund (July): Twenty-five pupal cells brought in on July 12 from Charles City County. First collection in pupal form. Number brought in and use as fish bait indicate their abundance.

#### A WEEVIL (Calonycterus setarius Roelofs.)

Connecticut. M. P. Zappe (July 13): Adults appearing somewhat later than usual and not so abundant as last year on desmodium and lespedeza at Stratford.

#### WIREWORMS (Elateridae)

Connecticut. A. W. Morrill, Jr. (July 17): Limonius axonus Say unusually abundant and widespread in the Windsor area, but disappeared about June 8 and did not reappear in most fields until plants were too big to be injured.

South Carolina. F. Sherman (July 22): Sand wireworm (Horistonotus uhlerii Horn) reported as destructive in the southern part of the State.

Minnesota. A. G. Ruggles and assistants (July 20): Moderately to very abundant in southern Minnesota.



- Utah. G. F. Knowlton (July 22): Potatoes, beets, corn, and other crops damaged in many fields at Lowiston, northern Utah.
- Washington. E. W. Jones (July 7): Larvae of L. canus Lec. damaged 50 percent of the early potato crop in certain fields at Kennewick, eastern Benton Count
- California. A. F. Howland (July 14): Two acres of corn at Downey, southern California, had less than a 10-percent stand, owing to injury by sugarbeet wireworm (L. californicus Mann.). Nine found per square foot in the soil when samples were taken, although the field was left without water for several weeks.

A CERAMBYCID (Frionus fissicornis Hald.)

- Nebraska. M. H. Swenk (July 15): About 70 percent of a 55-acre cornfield in Saunders County reported as damaged by larvae. Corn planted on ground just broken out of sod.

BEET WEBWORM (Loxostege sticticalis L.)

- North Dakota. J. A. Munro (July 20): Injury to gardens reported from the La Moure area. Moths reported as abundant in the Mandan and Minot areas.

- Nebraska. M. H. Swenk (July 15): Reported as appearing in large numbers in Garden County on June 27.

- Utah. Provo Daily Herald (June 15): Sugar beet crop in Utah County infested, probably worst in the Springville and American Fork areas. Much more prevalent than in previous seasons. Control measures applied.

- G. F. Knowlton (July 22): Moths abundant in light traps at Syracuse.

WHITE-LINED SPHINX (Sphinx lineata F.)

- Utah. G. F. Knowlton and W. P. Nye (June 30): Grapes defoliated in the vicinity of mouth of Rock Canyon, Utah County.

C E R E A L   A N D   F O R A G E - C R O P   I N S E C T S

WHEAT AND OTHER SMALL GRAINS

HESSIAN FLY (Phytophaga destructor Say)

- Michigan. R. Hutson (July 25): Caused serious damage in a 25-acre field of wheat at Deckerville, Sanilac County.

- Nebraska. M. H. Swenk (July 15): Infested wheat received from Nemaha County on June 24. The infestation follows the Missouri River north to Burt County. Wheat stems infested with puparia, brought in from far-western part of Cheyenne County on July 14, with the report that farmers in that area estimated the damage in some fields at 5 percent.

WHEAT STEM MAGGOT (Meromyza americana Fitch)

Minnesota. A. G. Ruggles (July 20): Many fields of wheat, barley, and rye have been badly damaged, one field showing from 20 to 30 percent injury.

ARMYWORM (Cirphis unipuncta Haw.)

Rhode Island. A. E. Stene (July 19): One outbreak of moderate severity reported from Portsmouth, Newport County.

Vermont. H. L. Bailey (July 25): No outbreaks reported. A few small specimens found under mowed oats at Bradford on July 7.

New York. N. Y. State Coll. Agr. News Letter (July 10): Moths observed at bait traps during the last 10 days in small numbers in comparison to those seen a year ago. A troublesome outbreak not forecast, but a mild and spotted infestation likely. (July 17): A few moths taken in light traps for a week or 10 days in Oswego County.

APHIDS (Aphidae)

Utah. G. F. Knowlton (July 13): Aphids damaging green oats in some fields examined at Springville and Mapleton. Most of the wheat and oats are maturing to the extent that aphids are leaving the plants.

Washington. L. G. Smith (June 27): Aphids found between kernels in heads of wheat south of Ralston, Adams County, on June 20, but no damage as yet. In Whitman County numerous reports of aphids on wheat from several sections. Practically all grain crops quite heavily infested in the LaCross and Endicott areas. Light infestation in Oakersdale-Tekoa area, although grain not so far advanced. In some fields every head is infested with a large number of aphids. (July 5): On June 23 grain aphids were seriously damaging some heads, but injury to fields of wheat and barley as a whole not serious in Granger, Yakima County.

CORN

CHINCH BUG (Blissus leucopterus Say)

Indiana. J. J. Davis (July 22): Appeared in destructive numbers in many areas of western Indiana, and caused considerable damage in several eastern counties especially in Jay County and the eastern part of Adams.

C. Benton (July 20): Owing to the unusually early maturing of the small grains, chinch bug migration to corn began earlier than usual, starting about June 20 to 25. Some migration prolonged until the middle of July by nymphs held in the stubble by grass upon which they had been feeding. In most fields no barriers were constructed and others too late for much value, therefore the resulting injury to invaded corn ranged from light to moderate on the first few rows up to several acres severely injured, as in several places in Tippecanoe County. First newly transformed adults observed in the field on June 26. By end of June most of remaining nymphs had reached the fourth and fifth instars. Dispersal flight of the new-



brood adults first observed as starting on July 6. Dispersal considerably accelerated in many fields by nearly 5 inches of rain on July 17. Heavy rain apparently had little effect in reducing the numbers of bugs, which at the time were predominately new adults.

Illinois. W. P. Flint (July 22): Spotted areas of damage have occurred. Infestation extremely spotted, with no area of general infestation. Single fields here and there over the State show damage.

Michigan. R. Hutson (July 25): Small infestations at Adrian, Morenci, and Monroe.

Wisconsin. E. L. Chambers (July 24): Light infestations reported on grainfields in Pierce County.

Iowa. C. J. Drake (July 8): In the chinch bug area in Guthrie County, migration is about over from wheatfields, and a large proportion of the bugs in the winged stage. Many immature stages in oatfields. Rains affected the population more in the oats than in wheat, owing to the fact that many of the heavy rains took place during the hatching period in the oatfields, at some time after the greater part of the hatching in wheat and rye. Losses would have been tremendous had it not been for the rains. Some barriers built in southernmost parts of Story and Boone Counties, also in other counties in the fourth and fifth tiers. Infestation heaviest in the western quarter of the State, just the opposite of what it was during the outbreak of 1934. The heavy center of infestation in Iowa extends from Guthrie Center to Red Oak.

Missouri. L. Haseman (July 25): Scattered infestations reported last month over much of the western half and north-central parts of the State.

Nebraska. D. B. Whelan (June 27): One acre of hegari destroyed near Lincoln.

M. H. Swenk (July 15): Reported as damaging crops during most of period from June 21 to July 15. Particularly plentiful in the southeastern corner of the State. Barley fields injured more than other small grains and held the largest populations of young bugs prior to their migration. Many wheatfields heavily infested by the middle of June. Migration of young bugs out of small grainfields began on June 15, and by June 23 the heaviest movement was under way in extreme southeastern Nebraska, especially in Richardson, Pawnee, and Johnson Counties. Despite hard rains early in July, there remained some small grainfields and stubble still well populated with immature stages that had not started their migrations, and the period of movement of the young bugs was extended to beyond the middle of July. By contrast, in the drought year of 1934 migration began on June 16 and was over by July 10.

Kansas. H. R. Bryson (July 26): Chinch bug populations on the increase in the eastern half of the State on July 25. Adults caused severe injury to late corn and sorghums in Washington, Jefferson, Nemaha, Brown, Riley, Anderson, and surrounding counties. The situation has been somewhat different this year. The bugs reached maturity in the small fields, instead of migrating as nymphs at harvest time. Owing to difficulty of controlling them as



adults, they distributed themselves evenly over the rowed crops and deposited eggs at or near the base of each plant. Second-generation nymphs are in the second instar and may cause considerable injury. Damage is accentuated by the hot, dry weather, which has favored the young bug but has retarded the growth of the plants.

Oklahoma. F. A. Fenton (July 24): Chinch bugs in barley at Sparks, in Lincoln County, and at Keystone, in Tulsa County. Infestation considered more severe than last year. Although winter survival approximately the same as a year ago, the unusually dry spring favored the development of the bugs. In many places, owing to the failure of the grain crop, sorghums were planted in the same field, with disastrous results. There has been an increase in grain and barley acreage in this State and, if this continues, we look for serious trouble.

CORN LEAF APHID (Aphis maidis Fitch)

Illinois. R. A. Blanchard and J. H. Bigger (July 12): Doing serious damage to corn in a number of fields in Union and Alexander Counties. Tassels and upper parts of plants seriously affected in 20 to 25 percent of the plants in some fields.

CORN EAR WORM (Heliothis armigera Hbn.)

Connecticut. N. Turner (July 18): Only a few seen on sweet corn.

New York. N. Y. State Coll. Agr. News Letter (July 24): Readily found in most fields of sweet corn on Long Island, but injury less severe than usual. (July 17): On Long Island the earliest plantings of corn had infestation by the first brood, although in general infestations were relatively low. Peak of the first-brood infestation apparently past. In Columbia County a few corn ear worms, nearly full grown, were noted. In Rockland County ear worms have caused about a normal amount of injury, about 10 percent of the ears being infested.

Virginia. H. G. Walker and L. D. Anderson (July 27): At Norfolk sweet corn maturing about July 10 was severely damaged, whereas the same varieties maturing about 10 to 15 days later, were only slightly injured.

Alabama. J. M. Robinson (July 14): Reported on corn at Henagar, northeastern part of the State, on June 11.

Mississippi. C. Lyle (July 24): Damage reported as heavy in the east-central, southeastern, and Delta counties.

Illinois. J. M. Wagner (June 27): Four acres of sweet corn in the Monsanto area a total loss owing to damage. Larvae of all stages observed in the ears, as many as four per ear.

Wisconsin. E. L. Chambers (July 24): Unusually abundant and attacking both sweet and field corn in the southeastern part of the State.

Missouri. L. Haseman (July 25): Rather unusual in its activity this summer, there being less tassel or bud infestation by the early brood than usual, but throughout the latter part of June and the first half of July there was an abundance of green larvae feeding in the open on tobacco, flowering tobacco, alfalfa, and other crops. Reports from various parts of the State. Early sweet corn showing considerable infestation.

Minnesota. A. G. Ruggles and assistants (July 20): Quite abundant on sweet corn. Some fields badly infested.

Nebraska. M. H. Swenk (July 15): Found to be clipping the silks of sweet corn in Madison County on June 24.

South Dakota. H. C. Severin (July 18): Abundant in sweet corn and doing considerable damage.

Utah. G. F. Knowlton (July 22): Reports of injury received from Farmington, northern Utah.

Washington. R. D. Eichmann (July 11): Early sweet corn at Prosser, Benton County, showed larvae in most ears on July 10.

J. C. Dodge (July 11): Larvae still very small on July 3 but had entered ears on a few plants in one field near Yakima.

H. P. Lanchester (July 18): Damaging corn in the vicinity of Walla Walla.

SOUTHERN CORNSTALK BORER (Diatraea crambidoides Grote)

Maryland. E. N. Cory (July 20): Attacking corn generally over the State.

Virginia. W. J. Schoene (June 26): Several complaints received of very serious injury to corn in the southeastern section of the State east of Petersburg and near the James River. Corn almost totally destroyed. (Det. by C. Heinrich.)

C. R. Willey and F. R. Freund (July 5): Destroying sweet corn at Montross, Westmoreland County.

Alabama. J. M. Robinson (July 14): Found on corn at Henagar and Guntersville, on July 5, both in the northeastern part of the State.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Maine. J. Hawkins. (July 18): Adults emerged from July 9 to 15 at Unity. Half-grown larvae were taken on corn at Portland on July 18.

Connecticut. A. W. Morrill, Jr. (July 17): Widespread and severe in the Windsor area, attacking much corn and potatoes and nearly killing the potato vines. Also taken in many home gardens and observed on rhubarb.

N. Turner (July 18): First generation very abundant. Many fields of sweet corn so heavily infested that the crop was a total loss. First pupae found on July 6, indicating an exceptionally early second generation.

New York. N. Y. State Coll. Agr. News Letter (July 17): On Long Island infestations range from negligible to an average population of more than 800 borers per 100 plants in some fields. Pupation now about 12 percent. Columbia County injuries in early corn variable, with some severe injury reported. Borers in harvested corn have ranged from individuals a few days old to those that have pupated. At present 2 percent of the larvae have pupated. Heavy infestation in Westchester, Rockland, Orange, Columbia, Ulster, and Albany Counties, all in eastern New York.

New Jersey. C. A. Clark (July 17): In 29 fields of early sweet corn surveyed in northern Burlington County from July 5 to 11, the average number of borers per 100 plants was 416, as compared with 50 found in 21 fields examined in the same section in 1938. The maximum number of borers per 100 plants in 1 field was 969 in 1939 and 202 in 1938. On July 10-11, pupation of the first generation in sweet corn had reached 57 percent, and emergence 2 percent.

Indiana. J. J. Davis (July 22): An enormous increase in eastern Indiana over 1938.

Wisconsin. E. L. Chambers (July 24): Scouting, started on July 10, revealed egg masses and newly hatched larvae on corn in Sheboygan County, and six other counties now found to have infestations.

STALK BORER (Papaipema nebris nitela Guen.)

Maine. J. Hawkins (July 18): Numerous and destructive in many parts of the State. Injury largely confined to corn.

Vermont. H. L. Bailey (July 25): Unusually abundant on July 21 in a garden of sweet corn at Rutland, Rutland County, western Vermont.

Wisconsin. E. L. Chambers (July 24): Reported from most of the counties in southern Wisconsin as attacking corn, potatoes, tomatoes, and garden plants.

Minnesota. A. G. Ruggles and assistants (July 20): More reports of damage than for many years.

Iowa. H. E. Jaques (July): Found in Winnebago County, north-central Iowa.

Nebraska. M. H. Swenk (July 15): Heavily infesting a cornfield in Washington County, on July 6. The field had been in permanent pasture until this year.



FALL ARMYWORM (Laphygma frugiperda A. & S.)

Georgia. T. L. Bissell (June 15): Patch of corn at Experiment was well infested on May 19, and two moths reared on June 10. In previous years I never obtained moths before August. (Det. by J. F. G. Clarke.)

Mississippi. C. Lyle (July 24): The most general outbreak in several years during the month. Specimens or complaints received from all sections of State. Owing to much rain in June, there is an unusually large acreage of late corn, which is the chief host. Control measures being used.

SEED-CORN BEETLE (Axonoderus lecontei Chaud.)

Nebraska. D. B. Whelan (July 15): Heavy flights at lights during the nights of June 26 and 27 in Lincoln.

GRAPE COLASPIS (Colaspis brunnea F.)

Indiana. J. J. Davis (July 22): Following abundance of the larvae attacking corn, an abundance of adults is observed.

CORN SILK BEETLE (Imperodes brunneus Crotch)

Louisiana. C. O. Eddy (July 25): The silk beetle of corn has increased its range in north-central Louisiana this year.

A SCARABAEID (Strigoderma arboricola F.)

Virginia. C. R. Willey and F. R. Freund (July 1): Specimen received from Hickory, Norfolk County, with the report that the beetle seems to work into the tassels of sweet corn.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Montana. F. V. Lieberman (July 10): Larvae collected on June 28, in Big Horn County. This county was first found infested last year but, as specimens were lost, I am sending a shipment of larvae, to remove any doubt as to the occurrence of the weevil in Big Horn County.

Utah. C. J. Sorenson (July 18): Very abundant during the latter part of June and early in July in parts of Emery and Utah Counties.

California. A. E. Michelbacher (July 21): The second brood reached its peak in the San Joaquin Valley on June 26. Larvae collected per 100 sweeps of an insect net ranged from 2 to 2,000, while the range in the adult count was 1 to 112. The larval count on July 10 ranged from 9 to 375 and the adult count from 0 to 67. Very scarce around Pleasanton. In the fields adjacent to the San Francisco Bay it is not abundant. On July 7 the number of larvae collected per 100 sweeps for the different fields ranged from 3 to 65 and on July 15 from 1 to 86. Parasitization by Bathyplectes

curculionis Thoms., based on collections of last-instar larvae, in the San Joaquin Valley on June 16 ranged from 0 to 14.17 percent in the different fields. Since that time no parasitization noted. In the field adjacent to the San Francisco Bay 14 percent of the last-instar larvae were found to be parasitized on June 22. No parasitization observed in the collections made on July 6.

PEA APHID (Macrosiphum pisi Kltb.)

Maine. J. Hawkins (July 18): A very light general infestation in central Maine developed into serious proportions but failed to injure peas extensively owing in part to weather conditions, parasites, and predators.

New York. N. Y. State Coll. Agr. News Letter (July 3): While not generally destructive throughout the State, so abundant in some localities that crops in many fields were completely destroyed, severe damage extending over considerable areas, particularly on late varieties of peas where control measures were not effective. Injury in many localities was aggravated by prolonged periods of dry weather and by mosaic. In areas where the aphid was particularly abundant, control operations were started on June 5 and continued through most of the week beginning June 25. Aphids still abundant in fields of later planted peas.

Wisconsin. J. E. Dudley, Jr. (July 17): Relatively scarce at Madison and vicinity throughout June, owing to rains and natural enemies. Marked increase in population began about July 5 and continued until the infestation became heavy. Crop of peas already set and damage confined to tips of plants.

Minnesota. A. G. Ruggles and assistants (July 20): Abundant on peas at Le Sueur.

Washington. L. G. Smith (July 5): Moderate-to-severe damage on all peas in the Centralia district, with the exception of early peas. A low population there now. In the localities of Sequim and Joyce, Clallam County, a moderate infestation noted on vetch and a light infestation on green-pod and Austrian winter peas.

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Louisiana. C. O. Eddy (July 25): Now abundant.

A PLANT BUG (Adelphocoris lineolatus Goeze)

Minnesota. A. G. Ruggles and assistants (July 20): Very abundant on alfalfa and sweetclover in Todd County.

CLOVER

CLOVER APHID (Anuraphis bakeri Cowen)

Idaho. J. R. Douglass (July 20): A serious outbreak has occurred in south-central Idaho. Clover-seed growers using control measures.

CLOVER ROOT BORER (Hylastinus obscurus Marsham)

Idaho. J. R. Douglass (July 20): Serious injury to clover stands in south-central Idaho and numerous inquiries received.

CLOVER SEED MIDGE (Dasyncura leguminicola Lint.)

Montana. H. B. Mills (July 17): Clover midge, probably D. leguminicola, extremely abundant and injurious in Lake County.

CLOVER HEAD WEEVIL (Tychius griseus Schaeffer)

New York. N. Y. State Coll. Agr. News Letter (July 3): Clover heads in some fields now showing the results of earlier injury by the immature stages. Reports of injury have come from Erie, Schuyler, and Seneca Counties. Insects now transforming to the pupal stage.

COWPEAS

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Georgia. T. L. Bissell (July 8): Much less abundant on snap beans in Spalding County, central Georgia, than a year ago. Infestation of cowpea pods first observed on June 19, earlier than any previous year, but the number of adults in peas now is light.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

Washington and Oregon. L. P. Lockwood (June 30): A survey to determine the limits of the area in the Pacific Northwest that is now infected began on April 17 and has continued to date. The following table shows the localities near which weevils have been found this year.



State and county	Locality
<u>Oregon:</u>	:
Clackamas-----	:Sandy, Orient, Boring, Danascus, Barton, :Stafford, Wilsonville, Mulley, Tonquin, Red- :lands, New Era, Canby, Barlow, Oregon City, :Mulino, Aurora
Marion-----	:Monitor, Donald, Champoeg, St. Paul, Mt. Angel, :Silverton, Central Howell, Shaw, Aunsville, :West Stayton
Washington-----	:Beaverton, Tualatin, Orence, Hazeldale, Reed- :ville, Laurel, Blooming, Hillsboro, Banks
Multnomah-----	:Garden Home, Gresham
Yamhill-----	:Dundee, Dayton, north of Newberg near River
Hood River-----	:Hood River, Parkdale
Wasco-----	:Mosier (Mr. Joe Schuh)
<u>Washington:</u>	:
Clark-----	:Washougal, Proebstel, Orchards, Vancouver, :Ridgefield
Cowlitz-----	:Woodland (in seed in mill at Woodland, Sept. :1938)
Skamania-----	:Stevenson
Klickitat-----	:Husum (B. J. Landis & W. W. Baker), White :Salmon

## FRUIT INSECTS

### SAN JOSE SCALE (Aspidiotus perniciosus Const.)

New York. N. Y. State Coll. Agr. News Letter (July 24): More evident each day in infested orchards in Orleans County, western New York.

Wisconsin. E. L. Chambers (July 24): Reported for the first time from several localities in Marinette and Brown Counties.

South Carolina. J. A. Berly and M. B. Stevenson, Jr. (July 22): Apparently above normal in abundance in the sandhill area of the State.

SCURFY SCALE (Chionaspis furfura Fitch)

New York. N. Y. State Coll. Agr. News Letter (July 24): Summer crawlers appearing rapidly in the Hudson Valley, and on July 22 about 65 percent of the eggs had hatched.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (July 21): Practically all spring-brood adults ceased coming to bait traps by July 1. First-brood adults began emerging in rearing cages at Poughkeepsie on July 13. Daily bait-trap captures increasing slightly since July 18. Peak captures expected the first week in August. Injury in the Hudson Valley by first-brood larvae the most prevalent observed during the last 4 years, especially in the Kinderhook area.

N. Y. State Coll. Agr. News Letter (July 17): In the Lake zone control will be necessary against first-brood worms until the end of July. Little or no second brood expected. Overlapping of broods expected in all other zones of western New York, as moths from both broods are now flying. Protection against first-brood larvae necessary through the third week of July.

Delaware. L. A. Stearns (July 22): Considerable early second-brood injury on apples just at harvest in the Bridgeville district. Second-brood activity started about July 11.

Virginia. W. S. Hough (July 22): Injury in northern Virginia in May severe for that time of year, but total injury not over the average.

A. M. Woodside (July 22): First-brood adults began emerging unusually early in Augusta County, bait-pail catches indicating that emergence started about June 27. Infestation of apples heavier than last season.

Indiana. L. F. Steiner (July 13): Activity of first-brood adults now at or near peak in the Vincennes area. Moth-catches from July 5 to 13, inclusive, from 4 orchards and 310 traps totaled 4,846. Eggs now hatching in relatively large numbers. First-brood injury in well-sprayed orchards greater than in 1938. Counts made on 135 scattered trees in 2 orchards showed an average of 1.5-percent infestation. (July 20): Population counts today in the Vincennes area indicated that adult abundance is at the highest point, although bait catches have fallen off slightly.

Illinois. W. P. Flint (July 22): Second-brood hatch well under way in the southern half of the State. Second brood bunched, but not to the same extent as the first brood.

Michigan. R. Hutson (July 25): Second-brood larvae appeared July 19 to 21 in Monroe, Berrien, Calhoun, Van Buren, Allegan, and Kent Counties.

Minnesota. A. G. Ruggles and assistants (July 20): Very little injury.

Missouri. L. Haseman (July 25): Much less abundant than for several years over the State generally. Peak of second-brood moth abundance almost simultaneous throughout the State, ranging around July 1. This is normally a little ahead of schedule and July larval hatch reached a peak around July 8 to 15, but July larvae, especially in central Missouri, were not abundant.

Utah. G. F. Knowlton (July 5): Larvae found infesting cherry fruits at Ogden and in Weber County. (Det. by C. Heinrich.) Adult moths reared last year from larvae infesting cherry fruit in Utah County.

C. J. Sorenson (July 18): Moderately abundant.

Washington. L. G. Smith (June 27): At East Farms, Spokane County, from June 1 through June 22, 162 moths caught. In the Yakima Valley approximately 9 percent of the spring-brood moths had emerged by June 19. Peak of first brood larvae entering fruit took place during the period May 29 to June 1. First larvae to leave the fruit taken on June 14. Large numbers of spring brood eggs continuing to hatch.

E. R. Van Leeuwen (July 18): At Yakima the maximum deposit of eggs by spring-brood moths occurred on June 29, and large numbers deposited from June 29 to July 10, although number of moths caught in baits was relatively low. Maximum number of larvae entering the fruit at about the same period. First moth of the summer brood emerged on July 7.

PISTOL CASEBEARER (Coleophora malivorella Riley)

Maryland. E. N. Cory (May 31): Found on apple at Hancock, western Maryland.

Illinois. W. P. Flint (July 22): Hatching began in west-central Illinois about July 1. Infestation increasing over that of last year. Some orchards show an infestation averaging approximately 2 casebearers per leaf, with individual leaves showing as high as 20.

LEAF CRUMPLER (Mineola indigenella Zell.)

Minnesota. A. G. Ruggles and assistants (July 20): Very abundant on apple at Columbia Heights, near Minneapolis.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Missouri. L. Haseman (July 25): Although occurring 2 years ago in great abundance, only an occasional colony observed throughout central Missouri this year.

APPLE CURCULIO (Tachypterellus quadrigibbus Say)

Missouri. L. Haseman (July 25): Feeding by adults continued into July, doing much damage to some varieties of apples throughout central Missouri.



## APHIDS (Aphididae)

Maine. F. H. Lathrop (July 20): Aphis pomi Deg. is more abundant in some orchards in York County than for at least 4 years. Infested leaves curled, but apparently no severe injury to trees or fruit. Tree growth slowing down and various natural enemies present.

New York. N. Y. State Coll. Agr. News Letter (July 3): Green aphids appearing in large numbers on terminal growth and fruits in Dutchess County, eastern New York. Green aphids apparently increasing in Niagara County, and found on a few fruits in all orchards in Clinton County, western New York.

(July 24): In western New York, green aphids still abundant in Niagara County, with very little parasitization evident. In Orleans and Wayne Counties very numerous and causing considerable damage. Terminal growth and some apples attacked. (July 17): The rosy apple aphid (Anuraphis roseus Baker) is almost gone in western New York, where a great deal of injury has occurred.

Virginia. W. S. Hough (July): Rosy apple aphid caused little or no injury on untreated trees in the Winchester apple-growing area, northern Virginia, but 50 miles south the injury ranged from moderate to very severe on untreated trees, and damage in commercial orchards varied according to control measures employed in March and April.

### WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

New York. M. D. Leonard (June 30): Light infestation on several apple trees at Flushing.

### BOXELDER BUG (Leptocoris trivittatus Say)

Utah. G. F. Knowlton and F. C. Harmston (July 11): Severely injuring ripening apples on a few trees at Meadow, Millard County.

### APPLE MAGGOT (Rhagoletis pomonella Walsh)

Connecticut. P. Garman (July 22): Present in about the usual numbers in apples in New Haven County. Emergence somewhat earlier than usual.

### A BEETLE (Euphoria fulgida F.)

Iowa. J. M. Bechtel (July 5): Found feeding on a few apples at Hamburg; as many as 5 or 6 per apple. (Det. by E. A. Chapin.)

## PEACH

### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (July 22): First generation unusually heavy. Second generation much less abundant.

South Carolina. O. L. Cartwright (July 22): Infestation of early and midseason peach fruits averaging about normal, although reported as above normal in some localities.

Georgia. O. I. Snapp (July 20): Of 870 ripe Hiley peaches from the station orchard at Fort Valley, 141, or 16.2 percent, found infested and of 2,141 ripe Georgia Belle peaches from the same orchard, 553, or 25.8 percent, found infested, as contrasted to 11 out of 4,600, or 0.24 percent, of ripe Elberta peaches in a commercial orchard near Fort Valley. Late peaches and apples furnish a host for hibernating broods of larvae in the station orchard, but they are not available in the commercial orchards in central Georgia. Infestation in the station orchard now somewhat heavier than of an average year, but not in commercial orchards.

Mississippi. C. Lyle (July 24): Reports of injury to apple and peach in Carr, Hinds, and Simpson Counties received between June 26 and July 6. Said to be abundant in the east- and west-central counties, and in the northeastern counties practically all young peach orchards show injury.

Indiana. L. F. Steiner (July 13): Adults coming to codling moth traps in the Vincennes area at the rate of 15 to 30 per day since July 1. Catch today was 52.

Missouri. L. Hasenon (July 25): Less abundant in the peach areas of south-eastern Missouri than usual. Some breeding experiments at Cape Girardeau showed 83-percent parasitization, mostly by native parasites. More damage than usual in the Saint Louis area.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Texas. R. K. Fletcher (July 22): Peach trees seriously injured on a farm in Cherokee County on July 10.

Utah. C. J. Sorenson (July 18): Moderately abundant in Davis, Box Elder, and Utah Counties.

Washington. E. W. Jones (July 1): Fruits of apricot damaged at Walla Walla.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maryland. E. N. Cory (July 7): Found in small peaches and plums in Baltimore County.

Virginia. A. M. Woodside (July 22): Adults of the summer brood began to emerge at Crozet about July 1. A few of the females contain eggs.

Georgia. O. I. Snapp (July 20): First mature second-generation eggs found in females on June 26 and first eggs found in peaches on June 28. Eggs from first-generation adults that emerged during the period May 31-June 5. Second-generation egg deposition began 13 days later than in 1938. Second-generation eggs deposited by 46.3 percent of the new beetles by July 19. Georgia Belle and Elberta peaches in central Georgia attacked by a heavy infestation of second-generation larvae that damaged much fruit. Adult population now heavier than that of an average year.

Mississippi. C. Lyle (July 24): Reported as abundant in the east- and west-central counties. Practically all peaches show some infestation.



Michigan. R. Hutson (July 25): Injury very noticeable in Saint Joseph and Berrien Counties, and in all fruit-growing areas in the southern half of the Lower Peninsula.

Minnesota. A. G. Ruggles and assistants (July 20): Moderately abundant.

Texas. R. K. Fletcher (July 22): Considerable damage to plums in an orchard in Tarrant County.

#### CHERRY

##### PEAR SLUG (Caliroa cerasi L.)

Nebraska. M. H. Swenk (July 15): Branch from a cherry tree showing injury received from Scotts Bluff County on July 12.

Utah. G. F. Knowlton (July 4): Severely skeletonizing some ornamental Crataegus sp. in gardens at Logan. (July 7): Cherry foliage damaged at Farmington and throughout orchard districts of Utah County.

Washington. L. G. Smith (July 11): Young cherry and plum trees in Clark County nearly stripped of leaves. Many home orchards attacked.

##### BLACK CHERRY APHID (Myzus cerasi F.)

New York. N. Y. State Coll. Agr. News Letter (July 3): Abundant on some sour cherry trees in Monroe County, western New York.

Utah. G. F. Knowlton (July 10): Much less abundant in curled cherry leaves at Farmington, than usual.

Montana. H. B. Mills (July 17): Hardly a problem in the cherry area of Flathead and Lake Counties.

##### CHERRY FRUITFLIES (Rhagoletis spp.)

New York. D. W. Hamilton (July 21): The last adult of R. cingulata Loew taken in emergence cages at Hudson, Columbia County, on July 1. Injury prevalent in unsprayed orchards.

Washington. H. J. Wood (June 27): First cherry fruitflies seen in the southern part of Spokane on June 21, although possibly some were out earlier.

Oregon. S. C. Jones (June 26): Peak of emergence of R. cingulata reached on June 15 in the Willamette Valley. Eggs found in the field on June 16, and maggots on June 23. (July 20): Last flies emerged in cages on July 7.

##### FLOWER THRIPS (Frankliniella tritici Fitch)

Indiana. J. J. Davis (July 22): Sweet cherries damaged in an orchard in Elkhart County. Thrips fed between contacting fruits, causing abrasions.



PEAR

PEAR PSYLLA (Psylla pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (July): Some injury being caused in Columbia and Dutchess Counties, in the Hudson River Valley. Populations building up considerably in Niagara, Orleans, and Wayne Counties, western New York.

Washington. L. G. Smith (July 26): Specimens collected in Spokane County on July 18. The survey, made on July 25, showed infestation present in the following districts of Spokane County: Vera, Opportunity, Greenacres, Otis Orchards, East Farms, and Green Bluff. Vera district most heavily infested, with severe damage, apparently the center of infestation, with the infestation decreasing to only a trace in the surrounding districts. The Greenacres area is about 15 miles north of Vera, with an open crop prairie in between the two districts. (Det. P. W. Oman.)

PLUM

RUSTY PLUM APHID (Hysteroneura setariae Thos.)

New York. N. Y. State Coll. Agr. News Letter (July 3): Several severe cases seen in Niagara County, the fruit stems being covered. Most orchards have them only on the terminal leaves, and many winged forms now appearing.

RASPBERRY

RASPBERRY FRUITWORM (Byturus unicolor Say)

Minnesota. A. G. Ruggles and assistants (July 20): More damage done to young raspberry plants than ever seen in the State. Damage particularly evident around Minneapolis and Saint Paul, but reports received from all over the State.

Michigan. R. Hutson (July 25): Considerable damage caused in a planting of raspberries at Clarkston, southeastern Michigan.

STRAWBERRY ROOT WEEVIL (Brachyrhinus sp.)

Utah. G. F. Knowlton (July 18): All raspberry patches examined in Utah County found to be infested.

GOOSEBERRY

APHIDS (Aphidae)

Nebraska. D. B. Whelan (June 22): Currant aphid (Capitophorus ribis L.) fairly numerous on leaves of currant at Big Springs, Deuel County, southwestern Nebraska.

Utah. G. F. Knowlton (July 22): Currant and gooseberry apical leaves severely curled in numerous localities this spring. Injury most commonly due to Aphis varians Patch.

GOOSEBERRY FRUITWORM (Zophodia convolutella Hbn.)

Utah. G. F. Knowlton (July 21): Gooseberry and raspberry fruits injured at Willard and Utah Hot Springs.

GRAPE

GRAPE LEAFHOPPERS (Erythroneura spp.)

Ohio. G. A. Runner (July 20): Summer brood generally quite abundant in the Sandusky and Lake Erie Islands area, averaging about the same as during the corresponding period in 1938. Vigorous vine growth this season has distributed feeding, and damage in most localities not severe.

Nebraska. M. H. Swenk (July 15): Grape leafhopper, E. comes Say, found to be severely attacking woodbine vines in Antelope County on June 23.

Montana. H. B. Mills (July 17): The Virginia creeper leafhopper (E. comes ziczac Walsh) is causing much less injury to Virginia creeper vines in Gallatin County than for several years. Many of the eggs are dying within the leaf tissues. First nymphs seen on July 10.

GRAPE PHYLLOXERA (Phylloxera vitifoliae Fitch)

Wisconsin. E. L. Chambers (July 24): Reported from home gardens in several localities.

GRAPE ROOTWORM (Fidia viticida Walsh)

Ohio. G. A. Runner (July 20): Feeding marks on the grape foliage in the Sandusky area indicate some increase in abundance, as compared to 1938, although in most vineyards observed the infestation is light.

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

Missouri. L. Haseman (July 25): In the last 10 days, apparently throughout the State, a sudden, unusually heavy outbreak has shown up, doing much damage in some vineyards, even where regular treatments were previously applied.

GRAPE LEAF SKELETONIZER (Harrisina americana Guer.)

New York. N. Y. State Coll. Agr. News Letter (July 3): Grape leaves observed in Rockland County, eastern New York, severely infested on June 30.

GRAPE BERRY MOTH (Polychrosis viteana Glen.)

Ohio. G. A. Runner (June 30): Solenopsis molesta Say and Grenatogaster lineolata var. near cerasi Fitch destroy pupae of the grape berry moth. The former almost completely destroyed about 10,000 overwintered pupae in lots of 500

in field cages in an experimental vineyard in the Sandusky area; found to be abundant and well distributed over the farm. (Ants det. by M. R. Smith.) (July 20): Infestation of the grape berry moth in the Sandusky area, as indicated by first-brood abundance, somewhat spotty and general lighter than in 1938, although very heavy infestations occur in some vineyards. Emergence of the first brood considerably earlier than usual.

GRAPE COLASPIS (Colaspis brunnea F.)

Missouri. L. Haseman (July 25): Unusually severe in June and feeding continued into July, but since the middle of the month very little evidence of them.

Louisiana. C. O. Eddy (July 25): Building up gradually.

SIX-SPOTTED GRAPE BEETLE (Pelidnota punctata L.)

Nebraska. D. B. Whelan (July 15): Adults common around lights at Lincoln late in June and early in July, particularly on June 14 and July 5.

M. H. Swenk (July 15): Specimen received from Furnas County on June 3.

PECAN

PECAN PHYLLOXERA (Phylloxera devastatrix Perg.)

Mississippi. C. Lyle (July 24): Specimens of serious injury to pecan received from Yazoo County on July 5.

PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Florida. S. O. Hill (July 21): Very scarce, at least about Monticello.

Texas. C. B. Nickels and W. C. Pierce (June): Field records show the extent of the destruction of the pecan crop by first-generation larvae to be as follows: Bastrop, 33 percent; Crystal City, 90 percent; Elgin, 55 percent and Lytle, 55 percent. Pecan crop produced in 1938 at all of these localities in southern Texas. Less than 10 percent of the nuts destroyed in orchards in central Texas, which produced few or no nuts during the preceding year.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Michigan. R. Hutson (July 25): Just beginning to be noticeable in Kalamazoo, Lansing, Detroit, and Monroe.

Missouri. L. Haseman (July 25): Only an occasional colony appeared throughout central Missouri, and no complaints received from other parts of the State. Larvae matured and pupation occurred during the early days of July.

Tennessee. G. M. Bentley (July 21): Damage done to walnut and persimmon foliage in Lawrence and Davidson Counties on July 5 and 11. Trees being defoliated in some places.



Oklahoma. R. G. Dahms (July 25): Some injury to pecans reported from southwestern Oklahoma.

FILBERT

APHIDS (Aphidae)

Washington. L. G. Smith (July 11): A severe infestation noted on the undersides of leaves of all filbert trees in Clark County on June '30. Average was 200 aphids per leaf. An abundance of ladybeetles present.

CITRUS

BLACK SCALE (Saissetia oleae Bern.)

California. R. S. Woglum (July): Widespread and marked increase is the outstanding feature of the citrus-insect-pest situation this summer. All orange districts show a definite increase.

A WEEVIL (Epicaerus formidolosus Boh.)

Florida. J. R. Watson (July 21): Sent in from Polk County, where it was doing serious damage to citrus trees in a young grove.

FIG

THREE-LINED FIG TREE BORER (Ptychodes trilineatus L.)

Louisiana. T. E. Snyder (July): Trunks of fig trees at New Orleans disfigured and weakened generally.

PAPAYA

PAPAYA WEBWORM (Homalopalpia dalera Dyar)

Florida. J. R. Watson (July 21): Sent in from Osceola County, where it was reported as destructive to papaya blossoms.

A PAPAYA HORNWORM (Erinyis sp.)

Florida. H. Spencer (July 21): Fullgrown larvae of Erinyis sp., probably alope Dr., collected on small papaya plants at Fort Pierce. Foliage stripped from plants in several hills.

GUAVA

A WEEVIL (Anthonomus costulatus Suffr.)

Florida. J. R. Watson (July 21): Sent in from Dade County, where it was reported as attacking guavas, particularly Cattley.

## TRUCK CROP INSECTS

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

- Maine. J. Hawkins (June 15): Squash and cucumber badly injured in many localities. Squash was in all cases the preferred host.
- Vermont. H. L. Bailey (July 25): Reports of unusual abundance in Washington and Chittenden Counties. Large field of squash badly damaged at Richmond, western Vermont. Most adults disappeared on July 18.
- Alabama. J. M. Robinson (July 14): Abundant around Auburn.
- Mississippi. C. Lyle (July 24): Reports of injury to watermelons and cantaloupe received from Chickasaw County on July 18 and from Lauderdale and Hinds Counties on July 22. Infestation very light in the commercial pickle area.
- Minnesota. A. G. Ruggles (July 20): Moderately abundant.
- Missouri. L. Haseman (July 25): Less abundant over the State generally this year, but on young cucurbit crops has caused some damage during the month. In the melon section of southeastern Missouri less destructive than usual.
- Nebraska. M. H. Swenk (July 15): Reports of damage to cucurbit plants received from Richardson, Otoe, Saline, and Merrick Counties from June 23 to July 5, inclusive.

CARROT BEETLE (Ligyrus gibbosus Deg.)

- Minnesota. A. G. Ruggles (July 20): Very abundant on sunflower and cabbage at Minneapolis.

RED TURNIP BEETLE (Entomoscelis adonidis Pallas)

- Minnesota. A. G. Ruggles (July 20): Moderately abundant on beans, peas, and carrots at Wadena.

## BLISTER BEETLES (Meloidae)

- Virginia. H. G. Walker and L. D. Anderson (July 27): Reported as rather abundant on tomatoes in Princess Anne County.
- Indiana. J. J. Davis (July 22): Reported as damaging sugar beets, potatoes, and various garden-vegetable crops in many places in the northern half of the State.
- Michigan. R. Hutson (July 25): Reported as feeding on potatoes near Detroit. Margined blister beetle (Epicauta marginata Say) reported as feeding on garden plants at Niles.
- Missouri. L. Haseman (July 25): Continually attracting attention during July throughout the State.

A. C. Burrill (July 4): Striped blister beetle (E. vittata F.) and gray blister beetle (E. cinerea Forst.) found in home gardens in Jefferson City.

Minnesota. A. G. Ruggles (July 20): Macrobasis unicolor Koy. abundant on potatoes and other crops in various parts of the State.

North Dakota. J. A. Munro (July 20): Damage to potato vines, clovers, and caragana hedges reported from scattered points in the State.

South Dakota. H. C. Severin (July 18): One of the major insect pests in South Dakota. Greatest amount of damage done to gardens and potatoes. In western part of the State beetles doing much damage to sugar beets.

Kansas. H. R. Bryson (July 26): Abundant in alfalfa fields on July 19. One record of beetles defoliating small trees at Monument, and causing injury to garden crops at Clifton.

Nebraska. M. H. Swenk (July 15): Several species reported. Infestation centered in eastern Nebraska, a few reports coming from south-central and northwestern Nebraska.

Utah. G. F. Knowlton (July 14): Spotted blister beetle (E. maculata Say) very abundant in gardens west of Randolph, Rich County, northern Utah, destroying garden plants.

Washington. J. C. Dodge (July 11): Severe damage to sugar beets over a small area 10 miles west of Wapato, Yakima County, on June 21.

#### TOBACCO THRIPS (Frankliniella fusca Hinds)

Connecticut. A. W. Morrill, Jr. (July 17): Heavy infestations observed in some fields in Windsor area, but general infestation apparently normal.

#### FALSE CHINCH BUG (Nysius ericae Schill.)

Florida. J. R. Watson (July 21): Sent in from Key Largo, where it was stated to be a serious pest of pineapples.

Minnesota. A. G. Ruggles (July 20): Reported as abundant in various parts of the State.

Montana. H. B. Mills (July 8): More abundant than last year at Choteau, Teton County. Moderate damage to peas, beans, turnips, radishes, and potatoes. (July 17): Locally injurious to alfalfa, wheat, clover, strawberries, lettuce, and other truck, but is disappearing rapidly, at least west of the Divide.

#### SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Alabama. J. M. Robinson (July 14): Reported on beans at Notasulga on June 30.

Mississippi. C. Lyle (July 24): Nymphs received from Simpson County on July 14 and from Holmes County on July 19 and reported as feeding on lima beans.



POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

- Maine. G. W. Simpson (July): Causing more damage than usual in Aroostook County.
- South Carolina. F. Sherman (July 22): More than normally abundant in western half of State. Eggplants defoliated.
- Minnesota. A. G. Ruggles (July 20): Moderately abundant.
- Missouri. L. Haseman (July 25): More destructive early in the season than for many years, and since the middle of July injury to late potatoes quite serious in central and east-central Missouri.
- North Dakota. J. A. Munro (July 20): More abundant than observed since 1936. Larvae began to appear on potato vines during the first week of July.
- South Dakota. H. C. Severin (July 18): Evidently returning and in some fields has done an unusual amount of damage.
- Idaho. R. W. Haeghele (July 17): Infestations in southwestern Idaho heavy and perhaps a little more widespread than in 1938. Damage light, but control measures necessary to prevent losses.

J. R. Douglass (July 20): Infestations still showing up, and doing light damage on the western end of the Twin Falls irrigated tract. Beetle first made its appearance in this area last season, and efforts being made to clean up the infestation.

POTATO FLEA BEETLES (Epitrix spp.)

- Maine. G. W. Simpson (July): Flea beetles survived the winter in larger numbers than during the last 3 years in Aroostook County.
- Connecticut. A. W. Morrill, Jr. (July 17): Second-generation emergence of E. cucumeris Harr. moderate but not heavy. Showed up one week early.
- N. Turner (July 18): Adults of E. cucumeris emerging in large numbers during the last few days. Serious damage to early potatoes.
- New York. N. Y. State Coll. Agr. News Letter (July 3): Severe infestation of potato flea beetles in Erie County, western New York. More numerous than during the last 3 years.
- Indiana. J. J. Davis (July 22): E. cucumeris damaged potatoes early in July.
- North Dakota. J. A. Munro (July 20): The potato flea beetle was abundant on potato fields in the vicinity of Fargo and moderately abundant at Park River. First injury to leaves appeared late in June.
- Washington. L. G. Smith (July 5): Foliage of potato and tomato plants in the Willapa Valley severely perforated by E. cucumeris on June 26. (July 11) Early planted potatoes at Ridgefield, Clark County, had tubers damaged by

larvae, which left them by June 30. At Montesano and Elma, Grays Harbor County, potato flea beetles were causing severe damage to early potatoes and attacking tomatoes on June 27.

POTATO STALK BORER (Trichobaris trinotata Say)

Maine. G. W. Simpson (July): More abundant than usual in Aroostook County. One field at Caribou reported with an infestation affecting 5 percent of the plants.

CORN EAR WORM (Heliothis armigera Hbn.)

South Carolina. F. Sherman and J. A. Berly (July 22): Infestation of tomato fruits apparently above normal.

Mississippi. C. Lyle (July 24): Injury to tomato in central Mississippi. E. W. Dunnam, et al. (July 1): Few found in tomatoes in Washington County.

Tennessee. G. M. Bentley (July 21): Reported as doing considerable damage to tomatoes in the Memphis section of Shelby County. Many growers losing 65 percent of their crops.

Ohio. H. C. Mason (July): Counts made of wormy, injured fruits of early market staked tomatoes at South Point late in June revealed an average of 21 percent of the fruits damaged.

Indiana. H. C. Mason (July): Considerable injury in unstaked early market tomatoes in the Decker area of Knox County on June 29. In 3 plantings larval injury to fruit ranged from 19.7 to 28.2 percent. On tomatoes which were considerably later in the same area, only an occasional egg or larva was found.

J. J. Davis (July 22): Unusually destructive to early tomatoes in Vigo County early in the month.

Nebraska. M. H. Swenk (July 15): Attacking tomato fruits in Richardson and Saline Counties on June 23 and 26, respectively.

Washington. L. G. Smith (July 11): In Benton County green tomatoes, 1 to 2 inches in diameter, show injury.

POTATO TUBER WORM (Gnorimoschena operculella Zell.)

Virginia. H. C. Denohoe (July 15): Within last few days reports of attack on barreled and sacked potatoes on the Eastern Shore have been numerous. An examination of one car on July 10 showed from 3 to 4 percent infestation. Car loaded for several days at this time. Reexamination of the same car on July 14 showed an infestation of 40 percent.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. A. F. Howland (July 20): In Los Angeles County fruit showing from 0 to 2 percent pinworm, except for 3 fields in San Pedro Hills area where parts of the fields showed as high as 15 percent injury. Some of the fields at Vista, San Diego County, showed as high as 7 percent injury. In the hill areas of Orange County 3 percent of the fruit found infested--very low for this time of the year.

HORNWORMS (Protoparce spp.)

Virginia. H. G. Walker and L. G. Anderson (July 27): Rather abundant on the Eastern Shore during the early part of July, but prompt control measures prevented them from causing much damage.

Indiana. J. J. Davis (July 22): Reported as abundant in tomato fields in many sections of the State.

Idaho. J. R. Douglass (July 20): Several larvae of tobacco worm (P. quinquemaculata Haw.) collected from tomatoes on experimental plots near Buhl. Damage light.

Utah. G. F. Knowlton (July 10): Few tomato worms found on tomato plants near Provo. Some damage to tops.

Washington. L. G. Smith (July 11): Eggs being laid and young worms hatching on July 7 in the Spokane Valley. No great numbers found, and little damage has occurred.

POTATO APHID (Macrosiphum solanifolii Ashm.)

Connecticut. N. Turner (July 18): Several acres of early potatoes in Fairfield County heavily infested and some fields killed. Infestation reported as unusually heavy in late potatoes in the Connecticut Valley. Growers applying control measures.

New York. N. Y. State Coll. Agr. News Letter (July 24): Abundant on Long Island and in western New York, in Chautauqua and Wayne Counties.

Idaho. J. R. Douglass (July 20): Heavy infestation and severe damage at Filer.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Connecticut. N. Turner (July 18): Much more abundant than in 1938. Unsprayed potatoes show severe tip-burn.

New York. N. Y. State Coll. Agr. News Letter (July 17): Increasing in numbers on Long Island, and hopperburn becoming apparent and serious in some fields where few control measures have been used. In Orange County leafhopper injury very severe in all fields examined.

Indiana. J. J. Davis (July 22): Noticeably abundant and destructive, especially in northern half of State.



Minnesota. A. G. Rugles (July 20): Very abundant in the State.

South Dakota. H. C. Severin (July 18): Doing much damage to potatoes over the State.

SIX-SPOTTED LEAFHOPPER (Macrosteles divinus Uhl.)

New York. N. Y. State Coll. Agr. News Letter (July 17): On July 10, while examining potato fields in Erie County, a new disease of potatoes for the State of New York was found in an early planting on a farm near Boston. Approximately 15 percent of one variety affected, while only 2 percent of the other variety showed symptoms. This disease is believed to be a form of western aster yellows, transmitted by the aster leafhopper which has been found feeding on many different plants.

A MIRID (Engytatus geniculatus Reut.)

Georgia. T. L. Bissell (July 18): All stages common on garden tomatoes at Experiment. Present in winter greenhouse tomatoes. Also found two stalks of tobacco (no other in vicinity) infested, but none found on pepper. Tomato plants with brown rings on stems, or girdles, caused by feeding. Bugs believed to prevent fruit setting. (Det. by H. H. Knight.)

BEEF LEAFHOPPER (Eutettix tenellus Bal.)

Utah. G. F. Knowlton (July 22): Tomatoes in fields examined at Willard, Tremonton, and Brigham only 1 to 4 percent infested with curlytop disease, which is lower than average.

POTATO AND TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Montana. H. B. Mills (July 17): Causing considerable injury to potatoes in parts of Yellowstone County. It is accompanied in small numbers by the psyllid Aphalara calthae L. and several other unidentified species.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

General. N. F. Howard (July 17): Injury to beans was evident late in June throughout southern Ohio, Kentucky, eastern Tennessee, and the Carolinas, as far as Charleston, S. C.

Maine. J. Hawkins (July 18): Reported as being more prevalent than usual at this time of year.

Connecticut. N. Turner (July 18): Damage as usual.

New York. N. Y. State Coll. Agr. News Letter (July 10): Few beetles and egg masses present in southern Tompkins; northern Chemung, Tioga, Schuyler, southern Yates, southern Seneca, Cortland, and Cayuga Counties. In Steuben and Allegany Counties a greater number of fields heavily infested. Control necessary from July 12 to 15. Same true for the Castile section of

Wyoming County. Eggs hatching in Livingston County. Infestation light Monroe County except in vicinity of Rochester. Beetles found for the first time north of Auburn in Cayuga County on July 5. Examination on July 6 in south end of county showed bean beetle in two or three fields. Last year one 2-acre field was all but destroyed. Adults readily found in Wayne County. (July 17): Moderate infestation in Steuben and Schuy Counties.

Delaware. L. A. Stearns (July 22): Injury general and about normal. First brood mature on July 13.

Virginia. A. M. Woodside (July 22): First-generation adults now emerging.

Georgia. E. E. Rogers (July 22): Exceptionally heavy infestation noted on beans at Valdosta on July 14.

Alabama. J. M. Robinson (July 14): Reported for the first time in Choctaw County which adjoins Sumter County, where it was reported last month for the first time.

Mississippi. C. Lyle (July 24): Specimens received from Chickasaw, Covington, Lee, and Yalobusha Counties between June 19 and July 18. Reports of injury received from Clarke, Clay, Jasper, Jones, Lauderdale, and Oktibbeha Counties. Other reports indicate a general infestation in the east-central counties, with heavy damage. In the northeastern counties reports indicate most of late beans as destroyed.

Louisiana. C. O. Eddy (July 25): Has increased from a single isolated infestation in Bogalusa in 1938 to an area 4 miles in diameter.

Kentucky. W. A. Price (July): Some damage to soybeans in the vicinity of Lexington in July.

Tennessee. G. M. Bentley (July 21): Untreated garden beans badly damaged on July 15. Reports received from Davidson, Lawrence, and Weakley Counties. A field of cowpeas at Lawrenceburg reported as heavily damaged.

Ohio. N. F. Howard (July 14): Adults of second brood (first adult progeny of overwintered beetles) very numerous and depositing eggs in large numbers at South Point. Early, untreated beans have been defoliated.

Indiana. J. J. Davis (July 22): Very abundant and destructive in most parts of the State.

Michigan. R. Hutson (July 25): Reported as feeding on snap beans at Sandusky, Bad Axe, Monroe, Adrian, Jackson, Lansing, St. Joseph, Allegan, and Grand Rapids.

Missouri. L. Haseman (July 25): Seems to have spread and caused some damage in new areas in southeastern Missouri, but generally over the infested area it is less harmful than last year.

Utah. G. F. Knowlton and F. C. Harnston (July 20): Injury severe on garden beans and less severe on larger commercial plantings in the Price-Wellington area of Carbon County.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Kentucky. W. A. Price (July): Some damage to soybeans during July in the vicinity of Lexington.

Missouri. L. Haseman (July 25): Attracting considerable attention during July in scattered gardens, some growers in central Missouri reporting serious damage on late beans.

Louisiana. C. O. Eddy (July 25): Abundant in southern Louisiana.

BEAN APHID (Aphis rumicis L.)

New York. N. Y. State Coll. Agr. News Letter (July 17): Prevalent on lima beans on Long Island, and many growers using control measures.

Idaho. J. R. Douglass (July 20): Complaints of moderate damage to lima beans and squash received from various growers around Twin Falls.

Utah. G. F. Knowlton (July 13): Aphids seriously damaging from 5 to 15 percent of lima bean plants in fields examined at Mapleton and southeast Springville.

LIMA BEAN VINE BORER (Monoptilota pergratialis Hulst)

Maryland. E. N. Cory (July 7): Attacking beans at Jesterville, Wicomico County.

BEAN THRIPS (Hercothrips fasciatus Perg.)

Utah. G. F. Knowlton (July 13): Injuring young bean plants in some fields in the Murray-Sandy-Draper area of Salt Lake County.

PEAS

PEA APHID (Macrosiphum pisi Kltb.)

Idaho. R. W. Haegeler (July 17): Infestations in red clover in southwestern Idaho more widespread than usual. Moderate-to-light damage. Control measures necessary in some districts.

Utah. G. F. Knowlton (July 10): Abundant on young alfalfa in North Logan, counts running as high as 150 aphids per sweep of an insect net. (July 13): Injury to garden peas apparent in many fields in Cache, Utah, Weber, and Box Elder Counties. All peas harvested, but yield and quality reduced in the more seriously infested areas. Little control work carried on, despite heavy aphid populations on canning peas in many districts. Some aphids at Smithfield died of disease. (July 22): Still high in some alfalfa fields, particularly in cooler valleys, while, in general, populations are low in warmer valleys.



Washington. L. G. Smith (July 11): Spots of damage noted in several fields of canning peas in the Blue Mountain district of Columbia and Walla Walla Counties on July 10. Damage light. Severe infestations beginning as canning peas were coming into bloom on June 27 at Montesano, in Grays Harbor County. In Clark County severe injury already done to pod peas, with a low population on June 30.

C. B. Whiting (July 19): Attacking canning peas around Mount Vernon. Damage probably generally greater in this county than a year ago.

L. G. Smith (July 15): Aphids have done severe injury to canning peas in Grays Harbor County. It is estimated that the yield has been reduced at least 50 percent.

#### PEA WEEVIL (Bruchus pisorum L.)

Michigan. R. Hutson (July 25): Reported as infesting garden peas at Lansing, Howell, Monroe, Jackson, Owosso, and Kalamazoo.

Idaho. T. A. Brindley (July 11): Little damage to first peas processed on June 30 from peas grown in the Palouse area of Idaho and Washington. (July 11) Weevils beginning to die off on July 15 at Moscow.

Utah. G. F. Knowlton (July 7): Damaging peas at Butlerville and Sandy.

Washington. L. G. Smith (June 27): Adults and eggs found on pod peas in Thurston County. (July 5): On June 26 in the Willapa Valley, Pierce County, green pod peas had from 1 to 4 pea weevils in each pod. Pods were just filling and peas still in bloom. (July 11): Severe damage to pod peas in Clark County, on June 30. From 4 to 6 eggs found on every pod. Some eggs hatched, and larvae were in seeds.

#### CABBAGE

##### APHIDS (Aphiidae)

New York. N. Y. State Coll. Agr. News Letter (July 24): Cabbage aphids general abundant on up-State field cabbage and quite noticeable in Ontario, Monroe and Orleans Counties, western New York.

Washington. L. G. Smith (July 5): Cabbage aphids just starting on tips of cabbage seed stalks in the Willapa Valley, Pacific County. Ladybeetles and syrphus flies abundant. (July 11): Colonies just becoming established on tips of seed cabbage stalks in Grays Harbor County. Growth too far advanced for aphids to do much damage.

##### HARLEQUIN BUG (Murgantia histrionica Hahn)

South Carolina. F. Sherman (July 22): Reported as more destructive than usual in the western part of the State.

Mississippi. C. Lyle (July 24): Causing injury to a garden in Covington County on June 19. Reported from Marshall County and from the east-central county.

ties, where the infestation is said to be general and heavy.

Nebraska. M. H. Swenk (July 15): Reported as damaging cabbage and other vegetables in Dawson County on June 27.

A CABBAGE WEEVIL (Ceutorhynchus assimilis Gyll.)

Washington. L. G. Smith (July 5): Few specimens of cabbage seed weevil collected in Pacific County this year for the first time. In Clallam County at Sequim, cabbage seed pods showed oviposition puncture on June 22. Few larvae found in pods. Adults abundant on wild mustard. (July 11): Adults attacking wild radish at Union, Clark County, on June 20, and wild mustard in Lewis and Cowlitz Counties. This may be the first record for both of these counties. Moderate damage to seed cabbage at Montesano and Brady, Grays Harbor County. Adults and larvae present.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Maine. J. Hawkins (July 13): Adults present at Monmouth, Kennebec County, and egg laying well under way.

New York. N. Y. State Coll. Agr. News Letter (July): Eggs and young nymphs in lower Hudson River Valley and western New York.

Wisconsin. E. L. Chambers (July 24): Observed in large numbers in truck-crop areas of Winnebago County in mid-July.

Missouri. L. Haseman (July 25): Apparently late in getting under way this year, but beginning to attract attention in central Missouri, ovipositing during the last week.

Louisiana. C. C. Eddy (July 25): Abundant.

Nebraska. M. H. Swenk (July 15): Complaints of attacking squash and cucumber plants received from Otoe, Burt, Saline, Platte, and Custer Counties from June 22 to July 5, inclusive.

D. B. Whelan (July 15): Adults seen laying eggs at Lincoln on July 11.

Oklahoma. F. A. Fenton (July 24): Reported on pumpkin vine at Sparks, in Lincoln County, and on watermelons in Ada, Pontotoc County.

Idaho. J. R. Douglass (July 20): Abundant in south-central Idaho and numerous inquiries regarding control received, but damage light.

Utah. G. F. Knowlton (July 25): Hundreds of adults, nymphs, and eggs present upon and under eight squash vines examined at Logan. (July 22): Injury reported from Davis, Cache, and Utah Counties in northern Utah.

SQUASH BORER (Melittia satyriniformis Hbn.)

New York. N. Y. State Coll. Agr. News Letter (July 24): Abundant and injury showing up freely in Monroe County. Larvae mostly small.

Michigan. R. Hutson (July 25): Reported from Detroit and Lansing.

Wisconsin. E. L. Chambers (July 24): Serious damage to squash vines in Dane and Milwaukee Counties.

SQUASH BEETLE (Epilachna borealis F.)

Missouri. L. Haseman (July 25): Squash ladybeetle working on squash in southeastern Missouri and doing some damage during the week ended July 22.

CUCUMBERS

PICKLEWORM (Diaphania nitidalis Stoll)

Mississippi. C. Lyle (July 24): Reported as causing injury to squash, cucumber and cantaloups in Hinds County on June 30 and to cantaloups in Simpson and Tate Counties. Very abundant at State College during July.

Louisiana. C. O. Eddy (July 25): Very abundant.

CARROT

CARROT RUST FLY (Psila rosae F.)

Washington. L. G. Smith (July 5): Few carrots showed injury after treatments on June 26 in the Willapa Valley, Pacific County. (July 11): Damage to commercial and home gardens throughout Whatcom County. At Chehalis, Lewis County, carrots observed in a garden 100-percent infested. Roots so injured that tops were wilting. Larvae nearly mature.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

Maryland. E. N. Cory (July 5): Attacking asparagus in Harford County.

South Carolina. F. Sherman (July 22): Adults taken on plants in the open at Clemson, the first record for this part of the State.

Utah. G. F. Knowlton (July 22): Slugs and adults found from Marriott, Weber County, to North Farmington, Davis County. Less dispersal of this recently introduced pest occurred this year than in 1938.



TURNIP

CABBAGE MAGGOT (Hylemya brassicae Bouche)

Maine. J. Hawkins (July 2): Unusually injurious to young rutabaga plants at Harrington. Cabbage suffered early injury but, on the whole, probably less serious than usual.

EGGPLANT

EGGPLANT LACEBUG (Gargaphia solani Heid.)

Ohio. N. F. Howard (July 14): Numerous and causing considerable injury at South Point.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (July 18): Onions along shore heavily infested but large fields in Hartford County show less infestation than usual.

New York. N. Y. State Coll. Agr. News Letter (July 24): Injury to muck onions approaching serious proportions in continued absence of rains. From 50 to 300 thrips per plant counted in end parts of extensive plantings in Madison County, while interior of fields showed only 10 to 25 per plant on July 18. In Genesee and Orleans Counties on July 20 the average was well over 25 thrips per plant. In Monroe County thrips have in some instances seriously injured upland onions and in Orange County, according to report, population is building up slowly.

Washington. K. E. Bigson (July 18): Damaging fall onions in experimental plots at Walla Walla. Damage particularly noticeable, as onions are late and have practically stopped growing.

L. G. Smith (July 11): Injury just showing up at Walnut Grove, Clark County, on June 30 but population increasing.

ONION MAGGOT (Hylemya antiqua Meig.)

Washington. L. G. Smith (June 27): A 5-acre patch of seeded onions at Medical Lake, Spokane County, badly damaged. (July 11): Some immature and mature larvae found at Walnut Grove on June 30. Some adults had emerged. Damage estimated at 10 percent.

RADISH

TURNIP APHID (Rhopalosiphum psuedobrassicae Davis)

Idaho. R. W. Haegele (July 17): Infestations of what is probably the turnip aphid found in most radish fields in southwestern Idaho. Heavy damage expected in a few fields.

SPINACH

SPINACH LEAF MINER (Pegomya hyoscyami Panz.)

Wisconsin. C. L. Fluke (June 27): Entire crop ruined at State Farm, Fond du County.

SWEETPOTATO

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

North Carolina. L. W. Brannon (June 16): Weevils numerous on sweetpotato foliage on several farms in Currituck County. This insect has never heretofore been observed on sweetpotatoes by either the writer or growers in that area. (Det. by L. L. Buchanan.)

STRAWBERRY

STRAWBERRY WEEVILS (Brachyrhinus spp.)

Montana. H. B. Mills (July 17): B. ovatus L. moderately abundant in Flathead County. One 28-acre field of strawberries, which has been treated constantly, has been practically cleaned of this pest.

Utah. G. F. Knowlton (July 7): B. ovatus and B. rugosostriatus Goeze damaging strawberry patches at Farmington, Centerville, and Bountiful, and both strawberries and raspberries throughout berry-growing areas of Utah County.

Washington. L. G. Smith (July 11): Moderate-to-severe damage by strawberry root weevil at Winlock, Lewis County. Nearly mature larvae in roots of plants.

STRAWBERRY CROWN BORER (Tyloderma fragariae Riley)

Indiana. J. J. Davis (July 22): More abundant and destructive in the Borden-Pekin area, southern Indiana, than last year.

Mississippi. C. Lyle (July 24): Plants infested with what appears to be larvae of strawberry crown borer received from Choctaw County on July 18.

Washington. L. G. Smith (July 11): Attacking strawberry plants in Lewis County on June 28. Most of the plants on 4-year-old plantings affected. Nearly mature larvae and pupae present, and some adults had emerged.

A ROOTWORM (Graphops pubescens Melsh.)

Indiana. J. J. Davis (July 22): Strawberry rootworm destructive to strawberry fields in the vicinity of Borden.

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Wisconsin. E. L. Chambers (July 24): More severe throughout the southern part of the State than for several years.

Utah. G. F. Knowlton (July 10): Larvae scarce in patches examined at Provo, Orem, and Springville, Utah County, late in June.

Washington. L. G. Smith (June 27): Immature and nearly mature larvae found on nearly every strawberry plant examined in the South Bay area of Thurston County on June 20.

STRAWBERRY CROWN MOTH (Conopia bibionipennis Bdv.)

Washington. L. G. Smith (July 11): Severe damage being done in Lewis County; 4-year-old strawberry plants 100-percent infested; mature larvae, pupae, and empty pupal cases collected.

SPITTLE BUGS (Cercopidae)

Washington. L. G. Smith (June 27): Adults and nearly mature nymphs present, with moderate to severe damage to strawberries, in Thurston County on June 20. Two to six adults present on each plant.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. A. F. Howland (July 18): Generally light infestation found in about 150 acres of California chili pepper in San Luis Rey Valley at Oceanside, San Diego County. In a part of one of the fields as high as 8 out of 18 pods to the plant showed punctures. A Bell pepper planting showed 50 percent of pods in one corner of field damaged. Only 1 infested field of chili pepper noted in Orange County.

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Georgia. T. L. Bissell (June 27): Feeding heavily on foliage and stalks of pimiento pepper in Pike County, central Georgia. Only a patch about 10 feet square in the field was damaged. This is the first record on this host of which the writer knows.

SUGAR BEETS

SUGAR-BEET ROOT MAGGOT (Tetanops aldrichi Hendel)

Idaho. J. R. Douglass (July 20): Caused serious damage to growing sugar beets on sandy soil in the Paul-Rupert area.

Utah. G. F. Knowlton (July 15): Causing moderate injury to some fields of sugar beets at Ogden.

FIELD CRICKET (Gryllus assimilis F.)

Nebraska. M. H. Swenk (July 15): Report from Morrill County on July 3 that nymphs were seriously damaging small sugar beets by eating the crowns and cutting off their tops.

MINT

MINT FLEA BEETLE (Longitarsus waterhousei Kutsch)

Indiana. J. J. Davis (July 22): Serious damage caused to mint in northern Indiana during the last month.



C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

- South Carolina. F. F. Bondy, et al. (July 8): Emergence from cages at Florence slightly less than average. (July 15): General increase in Florence County, but only a few fields badly infested and being damaged. (July 22): Weather conditions favorable this week, and damage begun in some fields, while few are found in other fields. Some field movement, and 25 caught on screen trap in the trap crop.
- Georgia. P. M. Gilmer, et al. (July 1): Injury from first-brood adults has begun in Tift, Berrien, Cook, Lowndes, and Echols Counties. Average infestation on untreated cotton in experimental plats rose from 3.1 percent to 10.7 this week. Treated cotton showed an increase from approximately 1.5 to 5 percent for the week. Injury all fresh, most squares on June 28-29 not being flared. (July 8): Activity in Tift, Berrien, Cook, and Lowndes Counties marked by a sharp rise in infestation levels, owing to first-brood activity. Indications of spreading out over territory heretofore lightly infested shown by increased infestation in isolated fields. (July 15): Second-brood adults beginning to appear in considerable numbers in this area. Now fairly common in the bloom, and infestation records show a rise over the previous week.
- Florida. C. S. Rude (June 17): Specimens sent in from Hillsborough County. Field visited and infestation of almost 50 percent found. (July 8): Twenty-five fields visited during the week in Lake, Alachua, Gilchrist, and Union Counties. Infestation ranged from 5 to 83 percent. (July 15): Little change in infestation since last week in 34 fields examined in Alachua, Gilchrist, Marion, Putnam, Union, and Lake Counties, except in Lake County where there has been a general increase. (July 22): Examinations made in 54 fields in the above counties show infestation to have increased somewhat over a week ago. For the week ending July 23, 1938, infestation almost exactly the same as this year, except in Lake County, where no infestation occurred last year until about mid-August. Several fields in Hillsborough County examined. No counts made, but weevils reported as doing considerable damage.
- Alabama. J. M. Robinson (July 14): Abundant around Auburn. More abundant in northwestern Alabama than for several years.
- Mississippi. C. Lyle (July 24): Infestation high in all sections of the State, except the northeastern corner, although, generally, about the same as in 1938. In the Delta high infestations near all wooded areas and fairly low in open plantations.
- E. W. Dunnam, et al. (July 22): In Washington County weevils are rapidly spreading to large open areas. Maximum square infestation near wooded areas around 50 to 60 percent in untreated cotton.

Fifty percent of points examined 1 mile from woods showed no infestation, while the other 50 percent showed infestations ranging from 1 to 10 percent.

R. L. McGarr, et al. (July 15): Noted as doing considerable damage in a few of the cotton fields examined this week in Oktibbeha and Lowndes Counties. During the week 5,500 squares examined in 14 fields showed an average of 29.4 percent squares punctured, as compared with 27.3 percent for last week, and 34 percent at this time last year.

Louisiana. R. C. Gaines and assistants (July 22): In Madison Parish an average of 16.8 percent of punctured squares found in untreated plots, on 22,800 squares, of which 3,819 were punctured. Average percentage of punctured squares in these plots ranged from 1.3 to 54.7. Examination of 5,838 fallen squares for July 15 showed a mortality of 47 percent, as compared with 50 percent from 3,385 squares on July 1 and 44 percent from 5,107 squares examined on July 15, 1938. Field flight-screen catch totaled 18, as compared to 19 in 1938 and 18 in 1937.

Texas. F. L. Thomas (July 5): Infestation causing damage on 33 of the 59 farms examined in the southern half of the State, particularly in Bastrop, Colorado, Fayette, and Waller Counties. In the coastal-bend area injurious only near the wooded areas. Severe damage reported near Brownwood, Brown County, in west-central Texas. (July 12): Rapidly increasing infestation checked somewhat by hot weather. In the black-land area of central Texas 53 farms in 9 counties showed weevils on all except 9 farms, and in sufficient numbers to justify control measures on 14. Slight increases in infestation in untreated river-bottom fields of Brazos and Burleson Counties. (July 19): In the northern half of the State 74 fields examined in 10 counties, and none found in 15 fields; damage caused in only 8. (July 26): Infestation in Falls, Limestone, and McLennan Counties only 15 percent, as compared with 20 percent the week before.

K. P. Ewing and W. S. McGregor (July 8): Considerable reduction in infestation this week over last in McLennan and Limestone Counties.

C. R. Parencia and S. E. Jones (July 15): Very scarce in Calhoun County. Apparently not of much importance in the Robstown area.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Florida. J. R. Watson (July 21): Specimens sent in from Pinellas County on July 7.

C. S. Rude and assistants (July 8): Heavy infestation reported from Seffner, Hillsborough County. Another infestation observed in Gilchrist County near Trenton. (July 15): Observed in Gilchrist, Putnam, and Union Counties. Damage noticed only in Gilchrist County.



Louisiana. R. C. Gaines (July 17): One fourth-instar larva found on a cotton plant at Tallulah, Madison Parish, on July 16.

Texas. F. L. Thomas (July 5): First larvae appearing in the Brazos bottom were found on June 29 and were two-thirds grown. (July 19): Beginning to appear in injurious numbers in the coastal counties and in several counties of central Texas, along the Brazos River. Control measures being applied in Nueces, Fort Bend, and Brazos Counties. (July 26): Found in a few additional fields in central Texas but little damage caused.

C. R. Parencia and S. E. Jones (July 1): Several found during the week in Calhoun County but no damage observed. (July 15): Very scarce in Calhoun County but present in the Robstown area. Reported as doing damage on the Chapman ranch.

BOLLWORM (Heliothis armigera Hbn.)

South Carolina. F. F. Bondy, et al. (July 22): Numbers on cotton increasing in Florence County, but very little damage.

Georgia. P. M. Gilmer, et al. (July 1): A few isolated reports of injury in Tift, Berrien, Cook, Lowndes, and Echols Counties. One report from Dawson, Terrell County, indicating severe damage in one field, was accompanied by specimens.

O. I. Snapp (July 5): Considerable damage at Marshallville, central Georgia.

Florida. C. S. Rude and assistants (July 22): Present in many fields in Alachua, Gilchrist, Marion, Putnam, Union, and Lake Counties, and considerable damage done to small bolls and squares. Situation about the same as a year ago, and less serious than at this time 2 years ago.

Mississippi. State Plant Board (July 24): Some damage reported from various parts of the State.

E. W. Dunnam, et al. (July 22): Several small larvae found in Washington County, but no complaints received.

R. L. McGarr, et al. (July 15): A few noted in some of the cotton examined this week in Oktibbeha and Lowndes Counties.

Texas. F. L. Thomas (July 19): Not threatening in northern Texas, while in south-central Texas injury has appeared in a few scattered river-bottom fields. (July 26): Eggs occur in fairly large numbers in young, succulent cotton.

A. J. Chapman (July 8): Moths quite numerous in Presidio County. Only a spotted larval infestation noted in blooms.



K. P. Ewing, et al. (July 15): In one experiment in Falls County this week 2,400 cotton terminals showed an average of 19.9 eggs per 100 terminals. In 14 different fields in McLennan and Falls Counties 5,300 additional terminals showed an average of 14.1 eggs per 100 terminals.

C. R. Parencia and S. E. Jones (July 15): Very scarce in Calhoun County.

TOBACCO BUDWORM (Heliothis virescens F.)

Louisiana. R. C. Gaines and assistants (July 8): A few squares in Madison Parish attacked by what appears to be this species. Injury apparently less than last year.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (July 1): Seven moths emerged from the hibernation experiment at Presidio during the week. Bloom infestation counts indicate the lightest infestation since records started in 1934. Counts in 20 fields in the Presidio Valley showed 9 to be infested. (July 8): Although average infestation of the entire valley much lower than last year, apparently the heaviest infestation is concentrated in the Candelaria area.

COTTON LEAF PERFORATOR (Bucculatrix thurberiella Busck)

Texas. R. K. Fletcher (July 22): Found to be very abundant on June 10 in a field in the Brazos River bottom, Burleson County. (Det. by A. Busck.)

COTTON LEAF HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy, et al. (July 22): Only a few present in the cotton in Florence County and doing no damage.

Mississippi. C. Lyle (July 24): Reports received from Marshall and Tallahatchie Counties, and signs of injury noted in the west-central counties, although infestation in general is very light.

Louisiana. C. O. Eddy (July 25): Damage caused in northwestern Louisiana.

Texas. F. L. Thomas (July 5): Increase in the northern half of the State, and some damage caused. Average infestation has more than doubled during the last week in Kaufman County, nearly doubled in McLennan and Falls Counties, and increased on all but 1 of 8 farms examined in Ellis County. In the southern half of the State control measures are needed on only 8 of 59 farms examined in 8 counties, Wharton County having the heaviest infestation in this area. Only light damage in the coastal bend area. (July 26): Numbers of adults much less abundant in northern and central Texas the last week. Young flea hoppers apparently leaving fields about as rapidly as they mature.

## FOREST AND SHADE - TREE INSECTS

### FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. H. L. Bailey (July 25): Much evidence of disease among larvae in Orange and Windsor Counties. Very little complete defoliation, but thinning of foliage in the upper White River Valley, central Vermont, and at Grafton and Chester, southeastern Vermont.

Washington. R. L. Furniss (June 26): During May larvae completely defoliated extensive stands of willow along the north bank of the Columbia River, in Cowlitz County. Appreciable defoliation noticeable on May 12. By May 23 many of the willows completely defoliated and immature caterpillars migrating in search of food. By June 15 a very large part of the population had died of starvation, and the remaining caterpillars were beginning to spin cocoons. Parasitization by tachinids comparatively low.

Oregon. R. L. Furniss (June 26): Very small larvae found on willows along the Coquille River near Coquille, Coos County, on May 20. While moderately abundant, it was evident that defoliation would be much less severe than in 1938, when willows and orchard trees in this vicinity were completely stripped. Extensive defoliation of several species of ceanothus by tent caterpillars (Malacosoma sp.) occurred this year in Josephine County, in the vicinity of Grants Pass. Infestation by this species slowly building up in this area since 1937. On May 19 a few mature larvae found, but most of them still actively feeding, and some had not left their tents. A high percentage of parasitization by tachinids was noted.

### WESTERN TENT CATERPILLAR (Malacosoma pluvialis Dyar)

Washington. R. L. Furniss (June 26): An outbreak occurred in the Puget Sound Basin. Heavy defoliation of alder noted in Pierce, King, Snohomish, and Skagit Counties. Other plants defoliated were apple, cherry (wild and cultivated), pear, plum, walnut, and wild rose. Considerable defoliation noted on May 11 on Whidby Island. On June 21 feeding nearly complete at Fairfax, and cocoon formation was beginning.

Oregon. R. L. Furniss (June 26): Light defoliation of orchard trees and wild rose noted near Lebanon, Linn County, on May 17, when larvae had reached maturity and were beginning to spin cocoons. In the coast counties moderately abundant on alder. On May 20 larvae were small and still congregated on the tents.

### BLUE-SIDED TENT CATERPILLAR (Malacosoma constricta Stretch)

Oregon. R. L. Furniss (June 26): On May 19 moderate defoliation of oaks (Quercus garryana and Q. kelloggii) noted near Grants Pass, Josephine County. At that time larvae had reached maturity. A high percentage parasitized by tachinids.



GREAT BASIN TENT CATERPILLAR (Malacosoma fragilis Stretch)

Oregon. J. M. Whiteside (June 26): After a lapse of nearly 10 years, this species has reappeared in epidemic proportions on the Deschutes National Forest, where it is causing a severe defoliation of bitterbrush (Purshia tridentata). As bitterbrush is the most important native browse and forage plant of western ranges, its defoliation for even 1 year is serious. Last epidemic on this forest occurred during the period 1928-30. Many pure stands of bitterbrush completely killed. Appearing on an area of about 640 acres in 1937, these caterpillars spread over such a large area in 1938 and 1939 that control measures are almost impossible.

FALL WEBWORM (Hyphantria cunea Drury)

Connecticut. M. P. Zappe (July 13): Apparently much more abundant than normal on many kinds of trees and shrubs in New Haven and Fairfield Counties.

New York. N. Y. State Coll. Agr. News Letter (July 10): Becoming somewhat abundant in Rockland and Ulster Counties, in the Hudson River Valley, and a few noticed in Clinton County, western New York.

R. D. Glasgow (July 17): The territory around Millbrook, Dutchess County, in the Hudson River Valley, is experiencing its heaviest outbreak since 1930.

New Jersey. F. A. Soraci (July 1): Quite abundant on mixed trees over the northern half of the State.

Georgia. O. I. Snapp (July 20): Infestation at Fort Valley, central Georgia, about that of an average year. Nests of full-grown larvae now common in most pecan groves.

Mississippi. C. Lyle (July 24): Generally abundant on pecan, persimmon, and hickory trees in most sections of the State.

FALL CANKERWORM (Alsophila pometaria Harr.)

North Carolina. B. H. Wilford and R. J. Kowal (June 30): Defoliation in areas along the Mount Pisgah motor road in Transylvania, Haywood, and McDowell Counties more severe this year than any year since 1936; defoliation along the Mount Mitchell motor road less than in previous years.

SPRING CANKERWORM (Paleacrita vernata Peck.)

North Dakota. R. H. Nagel (June 12): Complete defoliation of elm by May 30 in the park area of the resettlement project in the Shoyenne River Valley, in Richland and Ransom Counties. About 200 acres of mature river-bottom elm observed to be damaged in Shenford Township. Injury to wild plum, ash, and hackberry.



GYPSY MOTH (Porthetria dispar L.)

Vermont. H. L. Bailey (July 25): Extremely abundant in Windham County. Areas of oak woodland defoliated in Rockingham, Putney, and Westminster, southeastern Vermont. Larvae, pupae, adults, and new egg masses found on July 20 at Rockingham.

Rhode Island. A. E. Stene (July 19): Abundant in the State, but not in exactly the same locations as last year.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Pennsylvania. T. L. Guyton (July 17): Isolated arborvitae trees defoliated at Harrisburg.

Delaware. L. A. Stearns (July 5): Severe infestation on arborvitae at Hockessin reported and control measures recommended.

Maryland. E. N. Cory (July 20): Specimens sent in from Baltimore, Frederick, and Prince Georges Counties. In lower Prince Georges County found feeding on strawberries in the vicinity of heavily infested cedars.

Virginia. H. G. Walker and L. D. Anderson (July 27): Rather abundant and considerable damage caused to evergreen trees in the Norfolk area.

North Carolina. B. H. Wilford (June 30): Serious damage to ornamental conifers occurring in various sections of Asheville.

Z. P. Metcalf (July 15): Observed at Fallston.

South Carolina. F. Sherman and J. A. Berly (July 22): More abundant than usual.

Ohio. E. W. Mendenhall (July 11): Very destructive to evergreens in Columbus and Springfield, and southern Ohio towns and cities.

Indiana. J. J. Davis (July 22): Reported as abundant in southern Indiana.

Illinois. W. P. Flint (July 22): Very abundant in the southern third of Illinois. Infestation very severe in many towns and cities, and moderate to heavy in some country districts. Parasites apparently exerting very little influence.

Missouri. A. C. Burrill (June 29): More active this month than last at Jefferson City on arborvitae.

Kentucky. W. A. Price (July): Very abundant. Received from every section of the State.

Tennessee. G. M. Bentley (July 1): Causing injury to several arborvitae and junipers at Nashville, Davidson County.

Alabama. J. M. Robinson (July 14): Found on shrubs at Fountain on June 30.

Mississippi. C. Lyle (July 24): Specimens taken from arborvitae received from Choctaw, Clarke, Copiah, Hinds, Jones, and Scott Counties. Requests for information received from Holmes, Prentiss, and other counties.

Texas. R. K. Fletcher (July 22): Reported from Harris County on cedar and from Smith County on arborvitae.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Utah. G. F. Knowlton (July 22): Many willows and poplar trees heavily infested at Salt Lake and Logan.

PERIODICAL CICADA (Magicicada septendecim L.)

Indiana. J. J. Davis (July 22): Young orchards seriously damaged in Lake, La Porte, and Porter Counties.

Illinois. W. L. McAtee (July 2): For several miles on each side of Willow Spring, along the railroad tracks, evidences seen in partially or entirely browned trees, mostly oaks, of the most severe infestation ever seen. Somewhat less obvious damage noted in West Chicago, at about the Brookfield Zoo, and as far east as Wellsboro, Ind.

V. H. Condon (July 8): Occurrence reported as follows: Glen-coe, north of Chicago; Hinsdale and LaGrange, just west of Chicago; and as plentiful in the forest preserves lying along the western edge of Chicago and suburbs.

ASH

CARPENTER WORM (Prionoxystus robiniae Peck)

Nebraska. D. B. Whelan (June 23): Adults emerging from ash trees in Lincoln.

M. H. Swenk (July 15): Reported on June 26 as damaging an ash tree in Antelope County.

BIRCH

A BIRCH LEAF MINER (Fenusa pumila Klug)

New York. M. D. Leonard (July 11): A number of birch trees at Flushing showed a light infestation on June 27. Infestation now apparently somewhat heavier, but little real disfiguration of foliage.

New Jersey. M. D. Leonard (July 6): A great many birch trees examined in one part of Ridgewood show moderate infestation.

BRONZED BIRCH BORER (Agrilus anxius Gory)

Ohio. E. W. Mendenhall (July 26): Very bad on white birch in Columbus, destroying the trees.

CATALPA

CATALPA MIDGE (Cecidomyia catalpae Comst.)

Maryland. E. N. Cory (July 17): Observed on catalpa at Hancock, western Maryland.

CATALPA SPHINX (Ceratonia catalpae Bdv.)

Ohio. N. F. Howard (June 23): Numerous, and some trees defoliated at Columbus on June 19.

Nebraska. M. H. Swenk (July 15): Adult sent in from Furnas County on June 3.

COMSTOCK'S MEALYBUG (Pseudococcus comstocki Kuw.)

Michigan. E. I. McDaniel (July 25): Catalpa mealybug received from Detroit on July 20. Unusual in Michigan.

CEDAR

A TORTRICID (Tortrix cockerellana Kearf.)

Nebraska. M. H. Swenk (July 15): Reported from Thomas County on July 7 that red cedar trees in that locality were being defoliated.

CYPRESS

A CYPRESS LEAF MINER (Recurvaria apictripunctella Clem.)

New York. E. P. Felt (July 22): Bald cypress, showing considerable damage received from White Plains.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Massachusetts. J. V. Schaffner, Jr. (July 14): Some of the elm trees in Bellingham, Franklin, and Wrentham, Norfolk County, heavily infested.

Rhode Island. A. E. Stene (July 19): Unusually abundant and trees badly defoliated in some of the valley sections.

Maryland. E. N. Cory (July 1): Elm attacked at Towson, Baltimore County.

South Carolina. J. A. Berly (July 22): Destructive on street elms in Greenville.



New York. M. D. Leonard (July 20): A moderate to considerable amount of foliage injury on the many large American and English elms at Flushing on July 3.

New Jersey. C. W. Collins (July 19): Causing severe injury to elm foliage in Chatham, Florham Park, Whippany, Hanover, Pluckemin, and East Orange, northern New Jersey. Same trees severely fed upon for the last 3 years.

Idaho. R. W. Haegele (July 17): Many elms in southwestern Idaho defoliated as result of attack by first brood. No injury where treatment applied.

Washington. E. W. Jones (July 1): First-brood larvae are descending trunks of elm trees at Walla Walla, the leaves having been badly eaten; pupating at bases of trees.

#### SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus Marsham)

New Jersey. C. W. Collins (July 19): Collections of adults at six points in northern New Jersey, where collections have been made for several years, show a decrease in abundance in comparison with the 1938 records.

#### ELM COCKSCOMB GALL (Colopha ulmicola L.)

Michigan. E. I. McDaniel (July 3): Adults leaving the foliage of elm on June 19. Common this year in the southern half of the State.

Indiana. J. J. Davis (July 22): Unusually abundant, judging by the many specimens sent in.

#### APHIDS (Eriosoma spp.)

Indiana. J. J. Davis (July 22): Many letters received regarding the woolly elm aphid (E. americana Riley) and the woolly apple aphid (E. lanigerum Hausm.) on elm.

#### EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Wisconsin. E. L. Chambers (July 24): Apparently on the increase in southern Wisconsin, where it is now known to be established in about 12 localities. About 600 elm trees condemned in 1 nursery where it was found.

#### DOUGLAS FIR

#### DOUGLAS-FIR BEETLE (Dendroctonus pseudotsugae Hopk.)

Idaho. J. C. Evenden (July 20): During the last 3 years a large percentage of the mature Douglas-fir in the Shot Gun Valley, near Spencer, has been destroyed. Infestation still serious.

Oregon. F. P. Keen (June 26): Group killing unusually abundant this year on Douglas-fir along the Oregon coast, probably as an aftermath of forest fires in 1937.

A WEEVIL (Cylindrocopturus longulus Lec.)

Washington. R. L. Furniss (June 26): Damage to lateral and terminal branches of Douglas-fir by the Douglas-fir tip weevil exceedingly abundant throughout Washington, particularly on the prairie district south of Puget Sound. Damage most pronounced on poor sites with thin topsoil. Open-grown trees less than 25 feet high preferred, and trees over 12 feet high seldom seriously affected.

LARCH

LARCH SAWFLY (Lygaconematus erichsonii Htg.)

Montana. J. C. Evenden (July 20): Recently found along the Clark Fork River for a distance of some 25 miles west of Thompson Falls. Severe defoliation on western larch.

LINDEN

LINDEN WART GALL (Cecidomyia verrucicola O. S.)

New York and Pennsylvania. E. P. Felt (July 22): Reported as abundant and somewhat injurious in southern Westchester County, N. Y., and in the Philadelphia area, Pa.

A LEAF MINER (Chalepus rubra Weber)

Michigan. R. Hutson (July 25): Reported from Byron Center on July 11 as attacking basswood leaves.

A CHRYSOMELID (Baliosus ruber Weber)

Minnesota. A. G. Ruggles and assistants (July 20): Moderately abundant on basswood at Perham, Ottertail County.

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Pennsylvania. T. L. Guyton (July 17): Very numerous on black locust at Harrisburg.

Maryland. E. N. Cory (July 19): A very heavy defoliation on locust trees in Prince Georges and Charles Counties.

Virginia. W. S. Hough (July): Severe damage caused to locust trees in Frederick and Shenandoah Counties. Foliage of the black locust trees presents a brown, scorched appearance as seen from a distance.

North Carolina. E. H. Wilford (June 30): Foliage on black locusts in and around Asheville, Buncombe County, shows indications of great damage. Some areas of black locust, badly infested in 1937 and 1938, again attacked.

N. F. Howard (June 24): Very prevalent on honeylocust near Asheville.

Kentucky. W. A. Price (July): Much damage to black locust throughout the State.

Mississippi. C. Lyle (July 24): Adults on black locust sent in from Lafayette County on June 26.

#### LOCUST BORER (Cyllene robiniae Forst.)

Wisconsin. E. L. Chambers (July 24): Reported as quite serious in northwestern Wisconsin, where these trees are being planted in soil-erosion control.

#### MAPLE

#### AN APHID (Drepanaphis acerifoliae Thos.)

New York. M. D. Leonard (July 20): Many large sugar maple street shade trees at Jackson Heights considerably infested, with many alates per leaf and many full-grown apterae and young. Honeydew abundant on the leaves. Ladybird beetles (Adalia bipunctata L.) common, often several per leaf.

#### WOOLLY ALDER APHID (Prociphilus tessellatus Fitch)

North Carolina. T. L. Bissell (July 5): Leaves on lower branches of Norway maple heavily infested and killed by colonies at Lake Junaluska. Residents report infestation of maples as becoming heavier and more injurious to trees each year.

#### APHIDS (Aphidae)

Idaho and Washington. J. C. Evenden (July 20): A severe infestation on all Norway maple throughout the northern part of Idaho and of eastern Washington is causing a heavy leaf drop and will probably result in the complete defoliation of many trees before the end of the season.

#### COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Michigan. E. I. McDaniel (July 3): Hatching on June 25. Specimens from Niles and South Haven.

Wisconsin. E. L. Chambers (July 24): Quite abundant in several localities in southern Wisconsin.



A MITE (Phyllocoptes minutissimus Hodg.)

New York. E. P. Felt (July 22): A reddish velvety growth on red maple leaves, produced by a plant mite, reported in abundance on one tree at Syracuse.

OAKAN APHID (Myzocallis bella Walsh)

New York. M. D. Leonard (July 23): A moderate infestation on 1 good-sized pin oak tree under observation at Flushing, many of the leaves having 10 to 20 per leaf.

## GALL INSECTS

Pennsylvania. E. P. Felt (July 22): Honeycomb leaf galls (Neuroterus favosus Bass.) reported as somewhat common on an oak tree at Ivyland.

Nebraska. M. H. Swenk (July 15): Oak leaves infested with the oak pin gall, produced by the gall gnat Cincticornia pilulae Walsh, and with the oak button gall, caused by the gall wasp (Neuroterus umbilicatus Bass.), received on June 30 from Douglas County.

A LEAF MINER (Lithocolletes hamadryella Clem.)

New York. R. E. Horsey (July 20): White-blotch oak leaf miner disfiguring red oak leaves, and common on both native and planted trees at Rochester.

A MITE (Paratetranychus ilicis McG.)

Georgia. T. L. Bissell (July 20): Yellowed water and willow oaks at Griffin and Experiment noticed about June 1. Examination on June 13 showed injury to upper surfaces of leaves. Innumerable eggs and cast skins found, indicating old injury, but few mites. Several examinations since have produced very few mites. (Det. tentatively by E. A. McGregor.)

PINENANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

New Jersey. J. V. Schaffner, Jr. (July 24): Heavy infestations observed on July 10 throughout the New Jersey pine barrens, and plantations of shortleaf, red, and ponderosa pine on Belleplain State Forest noted as heavily infested. Pitch pine in the East and West Plains areas extremely heavily infested.

Maryland. E. N. Cory (July 20): Observed as attacking pine at Annapolis on July 1; on pine at Rockville and College Park.

Nebraska. M. H. Swenk (July 15): Request for control information received on July 10 from Cherry County.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Ohio. E. W. Mendenhall (July 22): Quite bad on mugho pine in nurseries in Summit County.

PITCH TWIG MOTH (Petrova comstockiana Fern.)

New York. C. L. Griswold (July 19): Pupae found at Chemung on May 29. Species abundant in a stand of pitch pine.

A WEEVIL (Hyllobius radialis Buch.)

Connecticut. E. P. Felt (July 22): Pine root weevil caused serious injury at New Canaan in a planting of Austrian pine, a considerable proportion of a plot containing several hundred trees being affected. Some of the trees killed and others weakened.

WHITE-PINE WEEVIL (Pissodes strobi Peck)

Virginia. C. R. Willey and F. R. Freund (July): Probably more abundant than usual in nurseries in northern Virginia, especially in Fairfax County. Infested pine shoots collected on June 29.

Wisconsin. E. L. Chambers (July 24): Quite serious in central Wisconsin on white pine and spruce.

PINE SAWFLIES (Tenthredinidae)

New Jersey. C. L. Griswold (July 19): Larvae of Acantholyda erythrocephala L. and Neodiprion sertifera Geoff. generally more abundant this season than during 1938 in pine plantations in several counties.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New York. (July 3): A light infestation observed on a number of large trees at Flushing.

Nebraska. M. H. Swenk (July 15): Infested twig of Black Hills spruce sent in on July 6 from Scotts Bluff County.

D. B. Whelan (June 22): On pine trees at Big Springs, Deuel County.

A SCALE (Toumeyella numismaticum P. & McD.)

Michigan. E. I. McDaniel (July 3): Young of the Scotch pine scale were hatching on June 20 and establishing themselves upon the bark of twigs and branches. Specimens from Jackson, Milford, and Muskegon. Reported as doing much damage to jack pine.

POPLAR

COTTONWOOD LEAF BEETLE (Chrysomela scripta F.)

North Dakota. J. A. Munro (July 20): Reported as abundant in western Dunn County, and at Streeter, Stutsman County.

VAGABOND GALL (Mordwilkoja vagabunda Walsh)

South Dakota. H. C. Severin (July 18): Present in unusual numbers on poplar

TULIPTREE SCALE (Toumeyella liriodendri Gmel.)

Virginia. C. R. Willey and F. R. Freund (July): A scattering of seedling trees of tulip poplar found infested in a field, which had been an old nursery block, in Fairfax County on June 27. A large tulip tree found very heavily infested on July 7 north of Richmond.

A TERMITE (Reticulitermes flavipes Koll.)

Connecticut. A. W. Morrill, Jr. (July 17): Feeding on poplar seedlings in Windsor.

SPRUCE

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Wisconsin. E. L. Chambers (July 24): Again quite abundant in Douglas and Washburn Counties, defoliating balsam and spruce in quite large areas.

Minnesota. A. G. Ruggles (July 20): Moderately abundant.

A SPRUCE GALL APHID (Adelges cooleyi Gill.)

Washington. F. P. Keen (June 26): Abundant on Sitka and Engelmann spruces in arboretum at Wind River Experimental Forest. Galls ready to open on June 10. Eggs and young found under cottony tufts on Douglas-fir needles at Mineral on June 15.

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Vermont. H. L. Bailey (July 25): High percentage of first-brood larvae had made cocoons by July 19 in the vicinity of Wilmington, Windham County, southern Vermont.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

South Dakota. H. C. Severin (July 18): Abundant and considerable damage done to spruce trees.



WILLOW

POPLAR AND WILLOW BORER (Sternochetus lapathi L.)

Oregon. F. P. Keen (June 26): Abundant in native willows around Portland.  
Full-grown larvae present on June 10.

W. D. Edwards (July 11): First adults observed at Portland. Most adults expected to emerge by August 1. Severe injury to river willows common in infested areas.

EUROPEAN WILLOW LEAF BEETLE (Plagiocdera versicolora Laich.)

Maryland. E. N. Cory (July 18): Found on willow at Annapolis.

AN APHID (Chaitophorus viminalis Monell)

New Jersey. M. D. Leonard (July 6): Infestation at Ridgewood, reported as of June 15, is now very heavy, and alates much more numerous. Still very abundant on the many large watersprouts.

I N S E C T S A F F E C T I N G G R E E N H O U S E

A N D O R N A M E N T A L P L A N T S

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Virginia. H. G. Walker and L. D. Anderson (July 27): Found killing azalea plants at Norfolk by barking the stems of the plants just below the surface of the ground.

A NITIDULID (Meligaethes mutatus Harold)

Delaware. E. P. Felt (July 22): Injury to sweet pea blossoms reported from Wilmington.

A CURCULIONID (Sitona flavescens Marsham)

South Dakota. H. C. Severin (July 18): Considerable trouble in June-grass lawns. Found rather heavily infested with adults and grubs, as many as 4 or 5 per square foot. (Det. by L. L. Buchanan.)

FLEA BEETLES (Halticinae)

Nebraska. M. H. Swenk (July 15): Specimens of Disonycha triangularis Say and Systema hudsonias Forst. sent in from Douglas County on June 22 with the report that they were found on asters and other plants and weeds.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Connecticut. J. P. Johnson (July 24): Prolonged drought together with favorable temperatures doubtless responsible for an increase in lawn

infestations. Populations have increased in certain infestations, and a count of 788 nymphs, including a very few adults, to 1 square foot was recorded.

Virginia. F. F. Dicke (July 1): Specimens of adults and nymphs collected at Arlington Farms on June 30. (Det. by H. G. Barber.)

PINEAPPLE MEALYBUG (Pseudococcus brevipes Ckll.)

Florida. C. A. Weigel (May 27): Correspondent reports this mealybug as doing serious injury to approximately 60,000 Asparagus plumosus plants being grown under slat roof at West Palm Beach. (Det. by H. Morrison.) Two species of ants, Solenopsis geminata F. and Brachymyrmex sp., associated with this infestation. (Det. by M. R. Smith.)

SOFT SCALE (Coccus hesperidum L.)

North Carolina. Z. P. Metcalf (July 15): Observed at Charlotte.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

South Carolina. C. F. Rainwater (July 22): Found on Nandina sp. and causing severe injury to Ligustrum sp. and other shrubs at Florence. (Det. by H. Morrison.)

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Maryland. E. N. Cory (July 19): Found on Japanese cherry at Mount Rainier.

Virginia. C. R. Willey and F. R. Freund (July 19): Second brood now hatching in Richmond.

Florida. Florence D. Howard (May 12): Heavily infesting kudzu vine at Jacksonville. (Det. by H. Morrison.)

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

Virginia. W. S. Hough (July): Late in May moths began emerging in swarms from the arborvitae trees growing on school grounds at Winchester. Larval damage conspicuous on many trees.

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Mississippi. C. Lyle (July 24): Azalea plants infested by this species sent from Walthall County on June 29.

COLUMBINE

COLUMBINE LEAF MINER (Phytomyza minuscula Gour.)

Maryland. E. N. Cory (July 18): Attacking columbines at Baltimore.

A WEEVIL (Conotrachelus anaglypticus Say)

Virginia. C. A. Weigel (June 23): Serious injury to columbine reported at Orange from what appears to be this insect.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Maryland. E. N. Cory (June 26): Found on euonymus at Frederick.

North Carolina. Z. P. Metcalf (July 15): Observed at Roaring River.

South Carolina. J. A. Berly (July 22): As prevalent in many places as usual.

Mississippi. C. Lyle (July 24): Severe infestations reported from Hinds, Madison, and Monroe Counties.

Texas. F. L. Thomas (July 22): Abundant on euonymus in McLennan County.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Maryland. E. N. Cory (July 14): Found on gladiolus at Pikesville, Baltimore County.

Virginia. H. G. Walker and L. D. Anderson (July 27): A number of infested plants received from different people in Norfolk early in July. Reported as heavily infesting their gladiolus plantings.

Mississippi. C. Lyle (July 24): Specimens of thrips from gladiolus received on June 26 from Winston County.

Wisconsin. E. L. Chambers (July 24): Many plantings of gladiolus in the State observed to be infested.

JUNIPER

JUNIPER SCALE (Diaspis carueli Targ.)

Maryland. E. N. Cory (July 18): Found on Pfitzer juniper at Lansdowne, Baltimore County.



LARKSPUR

AN APHID (Aphis rociadae Ckll.)

Minnesota. A. G. Ruggles (July 20): Very abundant on delphinium at Saint Paul.

LILY

A NOCTUID (Xanthopastis timais Cram.)

Mississippi. C. Lyle (July 24): Larvae, taken from lilies in Leflore County, sent in on June 27.

LILAC

LILAC BORER (Podosesia syringae Harr.)

New York. R. E. Horsey (July 18): Numerous in lilac at Rochester.

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (July 20): Quite common on several species of magnolia. More numerous than usual on this ornamental planting in Rochester.

PYRACANTHA

A LACEBUG (Corythucha arcuata Say)

Tennessee. G. M. Bentley (June 20): Reported on pyracantha at Chattanooga, Hamilton County.

ROSE

ROSE SAWFLY (Caliroa aethiops F.)

Washington. L. G. Smith (July 5): Causing severe netting of rose leaves in Thurston County on June 20.

A SCARABAEID (Trichiotinus piger F.)

Maryland. E. N. Cory (June 20): Found on roses at Cumberland.

A BEETLE (Luperodes sp.)

Texas. C. A. Weigel (June 17): Luperodes sp. near brunneus Crotch reported as proving extremely destructive to roses at Fort Sam Huston, near San Antonio. (Det. by H. S. Barber.)

A CHRYSOMELID (Antipus laticlavata Forst.)

Minnesota. A. G. Ruggles (July 20): Moderately abundant on rose at Wayzata, Hennepin County.

ROSE APHID (Macrosiphum rosae L.)

New York. M. D. Leonard (July 11): Many rose plants at Flushing repeatedly examined and found almost entirely uninfested.

New Jersey. M. D. Leonard (July 6): At Ridgewood a great many rose bushes, both climbing and shrub varieties, which have previously been at least lightly infested, showed almost no aphids.

POTATO APHID (Macrosiphum solanifolii Ashm.)

Utah. G. F. Knowlton (July 10): Observed in damaging abundance on apical growth of rose in several parts of northern Utah during the spring.

THRIPS (Thysanoptera)

New York. M. D. Leonard (July 21): Abundance of thrips reported in rose blooms in Queens County during July. Considerable damage to flower parts.

Mississippi. C. Lyle (July 24): Specimens of thrips on rose received from Hancock County on June 25. Reports of considerable injury to roses received from the southwestern counties.

Washington. L. W. King (June 27): On June 19 throughout Whatcom County rose buds were deformed by thrips, some failing to open and the flowers that did open being distorted.

SNOWBALL

SNOWBALL APHID (Aphis viburnicola Gill.)

Nebraska. D. B. Whelan (June 22): Snowball bushes affected at Big Springs, Deuel County.

SPIRAEA

SPIRAEA APHID (Aphis spiraeicola Patch)

New York. M. D. Leonard (July 20): A number of spiraea bushes, moderately infested earlier in the season at Jackson Heights, show almost no aphids at all now, nor for some time past.

SWEETGUM

A SCALE (Cryptophyllaspis liquidambaris Kot.)

New York. E. P. Felt (July 22): Liquidambar leaves showing abundant infestation received from New York City. Infestation evidently in that general area. (Det. by H. Morrison.)

WATERLILIES

AN APHID (Rhopalosiphum nymphaeae L.)

New York. M. D. Leonard (July 19): Several large patches of waterlily plants in a pool at Flushing considerably infested.

YEW

A MEALYBUG (Pseudococcus cuspidatae Rau)

Wisconsin. E. L. Chambers (June 26): Found injuring Japanese yew trees in a nursery at Milwaukee. (Det. by H. Morrison.)

A SCALE (Lecanium fletcheri Ckll.)

Wisconsin. E. L. Chambers (June 26): Specimens of insects working on Japanese yew trees in a nursery at Milwaukee. (Det. by H. Morrison.)



# INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

## MAN

### MOSQUITOES (Culicinae)

Florida. W. V. King (June 30): The crab-hole mosquito (Deinocerites cancer Theob.) reported as attacking man during the day and causing considerable annoyance on one occasion on a marsh in Broward County. The pitcherplant mosquito (Wyeomyia smithii Coq.) was collected for the first time in Florida near Tallahassee. Severe outbreaks of Psorophora columbiana D. & K. occurred during June throughout central Florida. A very large number appeared in the trap collection at New Smyrna on the night of June 23. Three heavy infestations of salt-marsh mosquitoes (Aedes sollicitans Walk.) occurred in Volusia County during May and June. Rains, rather than high tides, appeared to be chiefly responsible for the breeding.

### EYE GNATS (Hippelates spp.)

Georgia. A. L. Brody and E. E. Rogers (July 22): Exceptionally abundant at Valdosta. Largest catch ever made at Valdosta was made during the last month. Exceedingly annoying to workers outdoors.

Texas. C. C. Deonier (June): Found to be especially numerous in the irrigated district about Quemado.

### CLEAR LAKE Gnat (Chaoborus sp.)

California. A. W. Lindquist (June 30): First emergence occurred at Nice on April 26. Two peaks of emergence, May 24-28 and June 7-13, indicated. Greatest emergence within approximately 3/4 mile of shore. Emergence of the overwintering brood extended over a 52-day period. Length of the larval period of the overwintering brood somewhere around 8 months and possibly longer. Status traps have indicated a much lower incidence than last August.

### AMERICAN DOG TICK (Dermacentor variabilis Say)

Rhode Island. A. E. Stone (July 19): Apparently unusually abundant, and reports received of dogs being covered with them.

Delaware. L. A. Stearns (July 5): Severe infestation on several dogs at Glasgow, New Castle County.

Maryland. E. N. Cory (July 20): Numerous requests for information, indicating a rather general infestation.

J. A. Hyslop (July 15): Worst infestation observed in the last 20 years now occurring in the region of Avenel. As many as 100 ticks, in all stages of engorgement, removed from a single dog.

Gertrude Myers (July 15): Seldom found on one farm near Rockville, and very few found on the dog on this farm, although many complaints received from nearby. Barn owls have bred for the last 5 years in a dead tree on the lawn, possibly keeping the rodents cleaned out and thereby cutting down the population of ticks on this property.

Virginia. C. R. Willey and F. R. Freund (July): Very abundant. Many specimens sent or brought in throughout June and July. Picked off clothes in quantities, particularly when at a nursery 4 miles north of Richmond. Apparently about as numerous in nurseries in Loudoun, Fairfax, and Arlington Counties.

Wisconsin. E. L. Chambers (July 24): Very abundant in many sections throughout the State.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Virginia. C. R. Willey and F. R. Freund (July): Several specimens, collected in houses, received this spring. Specimens sent from Hampton on July 14 with the report that they were being annoying in an apartment.

Indiana. J. J. Davis (July 22): Reported as annoying the last month from several localities in Indiana.

CHIGGER (Eutrombicula alfreddugesi Oud.)

Maryland. E. N. Cory (July 20): Numerous requests for information indicate a general infestation.

Indiana. J. J. Davis (July 22): Chiggers annoying in many regions, especially in camp grounds.

Wisconsin. E. L. Chambers (July 24): Very serious infestation observed in a home yard, and many others reported in Dane, Jefferson, and Milwaukee Counties.

Missouri. A. C. Burrill (July 4): Chiggers (Trombicula tlalzahuatl Murray) very abundant and annoying at Jefferson City for the last week.

Nebraska. D. B. Whelan (July 12): Very bad in Lincoln and eastern Nebraska.

GRASS THRIPS (Anaphothrips obscurus Mull.)

Indiana. J. J. Davis (July 22): Oatsbug more prevalent and annoying than usual late in June and during the first half of July.

DEER FLIES (Chrysops spp.)

Utah. G. F. Knowlton (July 21): C. fulvastra Will. and C. discalis Wied. extremely annoying to man and livestock in meadows and near moist areas at Fielding, Collinston, Penrose, Syracuse, Farmington, Centerville, and Appledale.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody and E. E. Rogers (July 22): Unusual abundance of cases reported in Brooks and Lowndes Counties. At least 3 infestations per day on 15 animals found at Valdosta during the last month. An exceptional loss in young pigs during the last month reported from Lowndes County.

STABLEFLY (Stomoxys calcitrans L.)

North Dakota. J. A. Munro (July 20): Reported as particularly abundant on cattle in Stutsman County.

South Dakota. H. C. Severin (July 18): Apparently more abundant than usual.

Kansas. H. R. Bryson (July 20): Abundant and causing unusual amount of annoyance around barns and to animals on pasture

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody and E. E. Rogers (July 22): More abundant at Valdosta than at any time during the last year, about 500 per animal.

Kansas. H. R. Bryson (July 20): Abundant and unusually annoying around barns and pastures.

Texas. W. G. Bruce (June 30): Fairly abundant in the vicinity of Dallas since the middle of May, infestations on cattle ranging from 200 to 2,000 flies per head.

CATTLE GRUBS (Hypoderma spp.)

Washington. L. G. Smith (July 5): Dairy cattle near Allen, Skagit County, being attacked by heel flies on June 21. (July 11): Dairy cattle in the locality of Woodland, Cowlitz County, bothered on June 29.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus Nitz.)

Texas. O. G. Babcock (July): Infestations have decreased to the minimum during July.



LONG-NOSED CATTLE LOUSE (Linognathus vituli L.)

Texas. O. G. Babcock (July): Somewhat on the increase and holding its own so far this summer.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody and E. E. Rogers (July 22): Females began to appear at Valdosta in large numbers about the first week of July. Sheep and steers infested with as high as 30 ticks per ear. Ears in bad shape owing to closely massed, engorging females.

HORSE

NOSE BOTFLY (Gasterophilus haemorrhoidalis L.)

South Dakota. H. C. Severin (July 18): Very troublesome to horses over the entire State.

HORSEFLIES (Tabanus spp.)

Pennsylvania. C. W. Collins (July 20): A large horsefly, T. sulcifrons Macq., observed to be very abundant in the adult stage in Haycock and Nockamixon Townships, in northern Bucks County. Flies active in the middle of the day, moving to and fro over the road surface, over low areas bordering brooks, flying in and out the car windows, and annoying cattle in pasture.

Utah. G. F. Knowlton (July 21): T. sonomensis O. S., T. productus Hine, and T. punctifer O. S. are annoying horses and cows in various localities in northern Utah.

SHEEP

EAR TICK (Ornithodoros megnini Duges)

Texas. C. C. Deonier (June): Specimens taken on June 14 from the ears of sheep at Del Rio.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

ANTS (Formicidae)

Rhode Island. A. E. Stone (July 19): Carpenter ants on timber trees observed more readily, owing to the many hollow trees being blown over by the hurricane; a considerable number also reported from houses.

Delaware. L. A. Stearns (July 12): Infestation of red ants reported in dwelling at Newark, New Castle County.

Indiana. J. J. Davis (July 22): Lawn ants, as well as those occurring in the house, reported as annoying and unusually abundant the last month.

Mississippi. C. Lyle (July 24): The Argentine ant (Iridomyrmex humilis Mayr) reported from houses in Monroe, Sunflower, and Yazoo Counties between June 26 and July 8. In the southwestern counties these ants are said to be very annoying. Specimens of the fire ant (Solenopsis xyloni McCook) received from Union County on June 30 and Leflore County on July 18. Reports indicate them as abundant in Grenada and Tate, as well as the west-central counties.

Missouri. A. C. Burrill (July 6): About twenty workers of Monomorium minimum Buckley found on tiger lily leaves at Jefferson City. (July 17): Very few found on leaves and none on buds of tiger lily.

Nebraska. M. H. Swenk (July 15): The mound-building prairie ant (Pogonomyrmex occidentalis Cross.) found infesting a lawn in Sheridan County on July 10, and reported as attacking a cottonwood tree and entering a house.

DRUGSTORE BEETLE (Stegobium paniceum L.)

Pennsylvania. S. H. Knight (July 10): Reported that these beetles have appeared in a house at Philadelphia at about this time of year for the last 3 or 4 years. (Det. by W. S. Fisher.)

BLACK CARPET BEETLE (Attagenus piceus Oliv.)

Rhode Island. A. E. Stone (July 19): Buffalo carpet beetle (Anthrenus scrophulariae L.) usually not so abundant as the black carpet beetle, but abundance about the same this year.

Nebraska. M. H. Swenk (July 15): Specimens sent in from Madison County on June 22.

TISSUE PAPER BUG (Thylognathus contractus Mots.)

North Carolina. E. A. Back (July 26): Larva infesting silk. (Det. by A. G. Boving.)

A CLOTHES MOTH (Tineola walsinghami Busck)

Florida. J. R. Watson (July 21): Brought in from Alachua County.

FIELD CRICKET (Gryllus assimilis F.)

Nebraska. M. H. Swenk (July 15): Proving a nuisance in buildings in Burt County late in June.

A WHARF BORER (Nacerda melanura L.)

Connecticut. N. Turner (July 18): Two lots of adults sent in from infested buildings during the last month.

Ohio and Illinois. J. J. Davis (July 22): The wharf beetle reported as annoying in buildings from Cleveland and Toledo, Ohio, and Chicago, Ill.

Michigan. E. I. McDaniel (July 3): The wharf beetle was taken from a basement in Detroit, having apparently come from rotting timbers.

#### MISCELLANEOUS INSECTS

California. S. Lockwood (June 27): On June 9 a weevil, Rhynchites velatus Lec., found in California on the eastern slope of the Sierras, feeding rather extensively on fruits of Prunus andersonii, a native range plant. Insufficient in numbers to make collection easy in an area about 19 miles northwest of Reno, Nev.

North Carolina. L. W. Brannon (June 16): Larvae of chrysomelid (Lema lecontei Clark) observed completely defoliating jimsonweed in Currituck County. Larvae and newly emerged adults very numerous. (Det. by H. S. Barber.)

Alabama. J. M. Robinson (June 30): Reported from Forkland, Greene County, that in the last 2 years the scale Dactylopius confusus newsteadi Ckll. has reduced the pricklypear from entirely covering the ground to being scarce. (Det. by H. Morrison.)

Idaho. C. H. McDonald (July 1): By late June of 1937 foliage of the snowberry over approximately 150,000 acres of the Burley section of the Minidoka National Forest had been completely stripped by caterpillars of a saturniid, and the larvae had died, apparently from starvation. Some appeared on nearby roses, serviceberry, and other shrubs, but no form of reproduction apparent, and no adults to be linked with the larvae. None seen in 1938. By May 1, 1939, the snowberry was covered with this caterpillar, and a survey of 3 days revealed that even larger areas are infested than in 1937. However, 90 percent are dying, clinging to the stripped bushes. Snowberry in most sections is barren and dried up. No adults apparent. (Det. by C. Heinrich as Pseudohazis sp., probably P. hera Harr.)

New Jersey. M. D. Leonard (July 6): At Ridgewood a small patch of milkweed plants, which were uninfested when last examined on June 15, has a very considerable number of aphids (Myzocallis asclepiadis Monell) on most leaves. Adalia bipunctata L. present on the plants.



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THE STATE ENTOMOLOGICAL  
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## THE MORE IMPORTANT RECORDS FOR AUGUST

Throughout the upper Great Plains egg laying by grasshoppers is well under way. Reports of damage in the New England and Middle Atlantic States, south to Pennsylvania, have been received from scattered localities.

The European earwig was reported late in July for the first time from Montana.

Decided increase in the population of the Japanese beetle was reported from parts of New England.

The Asiatic garden beetle was reported in large numbers in various localities from New York southward to the District of Columbia.

The weevil Calomycterus setarius Roelofs was reported as troublesome in houses in Connecticut and New York.

Blister beetles were generally abundant from New York southward to the South Atlantic States and westward to Mississippi. They were also unusually abundant and doing considerable damage in the East Central, North Central, and Plains States, and westward to the Pacific Northwest.

The fall armyworm was occurring in scattered outbreaks from New York to Florida and the Gulf States.

The hessian fly was reported on the increase from Ohio to Nebraska.

The wheat jointworm occasioned economic losses in Ohio for the first time in nearly 30 years.

The black grain stem sawfly was reported from the Middle Atlantic and eastern part of the East Central States.

Very late damage by the green bug was reported from Kansas.

Damage by the European corn borer was reported from Connecticut southward to eastern Virginia. This insect was found for the first time in North Carolina just across the State line from Virginia.

The corn leaf aphid was generally prevalent in the Middle Atlantic and East Central States, westward to Nebraska.



General spread of the vetch bruchid was reported from North Carolina and South Carolina. This insect also has been discovered 40 miles south and across the Cascade Mountains from localities where it was formerly known to occur in Oregon.

Second-brood codling moth was reported doing damage in parts of New York and New Jersey, southward to Delaware and Virginia, and in the Mississippi Valley. The insect seems to be above normal in Indiana. In Washington State the second brood flight reached its peak during the middle of August.

The oriental fruit moth was reported generally from Delaware and Indian southward to the Gulf States.

The grape trunk borer (*Clytopleptus albofasciatus* Lap.), which has caused severe damage in the Sandusky area of Ohio during the last 2 years, was again very abundant.

General injury to strawberries and severe injury to flax in parts of the Willamette Valley of Oregon by the strawberry fruit worm was reported during the month.

Unusual abundance of hornworms attacking tomatoes were reported from Vermont, New York, Kansas, and Utah.

Second-generation Mexican bean beetles were reported as generally destructive throughout the range of this beetle.

Damage by the bean leaf beetle was reported from the Gulf region.

Severe injury by the harlequin bug was generally reported from the Gulf region to Kansas and Kentucky. The insect was also reported from Nebraska and a few specimens were taken in Connecticut, the latter being the first recorded since 1910.

Heavy infestations of the onion thrips were reported from Connecticut and New York and the Black Hills section of South Dakota.

The boll weevil was generally prevalent and destructive in the South Atlantic States and Gulf region. In Oklahoma and Texas hot dry weather has generally held this insect in check.

Severe damage by the bollworm was reported from the South Atlantic and Mississippi Valley States, westward to Texas.

The cotton leaf worm has done very little damage this year in the Cotton Belt.

Considerable increase in the pink bollworm was observed in Cameron County and the southeastern part of Hidalgo County, Tex.

The cotton flea hopper was reported in damaging numbers from Oklahoma and Texas.

Cotton aphids were generally prevalent in the eastern part of the Cotton Belt, after treatment for boll weevil.

General infestation by the fall webworm was reported from the New England States southward to Florida, and from the East Central States southward to Mississippi.

Severe damage by the elm leaf beetle was reported from the eastern part of Massachusetts through Connecticut into southeastern New York. It was also prevalent in Pennsylvania, Virginia, and Ohio.

General damage by the locust leaf miner was reported from Massachusetts southward into Pennsylvania, Maryland, Virginia, and Mississippi.

Large areas of maples were being defoliated by the green-striped maple worm from Vermont and Massachusetts and across Michigan to Minnesota.

Rather heavy infestations of screwworms were reported from Georgia and Florida.

#### THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA FOR JULY AND AUGUST

The grasshopper outbreak in the Prairie Provinces was reduced materially by a widespread and well-organized poisoning campaign; however, the results of this work were offset to some extent in certain areas by grasshopper migrations. In Manitoba flights of immigrant grasshoppers resulted in increased infestations and damage in south-central and, to some extent, in west-central districts. Wheat and late oats and barley were seriously affected. Heavy losses occurred in an area 15-25 miles wide along the international boundary from Morden to Boissevain. Hot, dry weather in August was favourable for oviposition. In Saskatchewan there were flights of grasshoppers in many localities, but these were largely finished by August 10. Counts of dropping of heads of grain by grasshoppers indicate that losses for southeast Saskatchewan average 30 percent for oats and barley, with wheat averaging 18-percent loss south of Moose Mountain, and 8-percent loss north to the Qu'Appelle Valley. In Alberta grasshopper migrations were confined to the southeastern part of the Province, where extensive losses to late crops occurred.

Blister beetles are prevalent in the grasshopper-infested areas of the Prairie Provinces, causing damage to crops, weeds, and ornamental hedges.

The wheat stem sawfly infestation appeared to be materially greater than that of last year in Saskatchewan. Both in this Province and in southern Alberta, practically the entire plains area was infested and the species caused important damage to wheat. Severe-to-light infestations of the eastern wheat stem sawfly (Cephus pygmaeus L.) were found in many wheat-growing areas of Ontario.

Heavy infestations of Say's stink bug occurred in many localities in Alberta, from Calgary and the Red Deer River, south to the international boundary. From 10- to 50-percent damage was expected in many grain fields.



The European corn borer infestation in southern Ontario is reported to not quite so heavy as in 1938.

A serious outbreak of the onion thrips developed throughout certain districts in southwestern Ontario.

Flea beetles were injurious to field and garden crops in eastern Canada and the Prairie Provinces.

Slight extensions are recorded of the distribution of the European spruce sawfly in Pontiac County, Quebec, and around Lake Nipissing, Ontario.

An extension of the spruce budworm outbreak in the Algoma area, Ontario, and an increase in numbers of this species in eastern Ontario and western Quebec has been reported. The serious outbreak in jack pine, first reported in 1936, continues to be severe in northwestern Ontario and southeastern Manitoba.

A heavy infestation of the satin moth occurred at West Bathurst, New Brunswick, showing a considerable spread northward from the nearest previous record. Complete defoliation of poplars was observed in a number of localities in New Brunswick and Nova Scotia.

There has been a general subsidence of the forest tent caterpillar outbreak in eastern Canada, although infestations still persist in the Kipawa area, Province of Quebec, and in eastern Ontario.

Nearly all larch stands from Fernie and Kimberley, to the north end of Slocan Lake, British Columbia, and northward 80 miles from the United States border, are infested to some extent by the larch sawfly. In certain concentrated areas from 85 to 90 percent of the trees were completely stripped. Throughout central New Brunswick the infestations appear to be declining. Defoliation in Ontario and Quebec has not been so severe as in 1938.

The black carpenter ant is proving to be seriously destructive to telephone and electric power poles in the Winnipeg area, Manitoba.

Reports indicate that the codling moth is not a serious pest this season in well-sprayed orchards in the apple-growing districts of Nova Scotia, Ontario and British Columbia.

The apple aphid and the rosy apple aphid were numerous and caused damage in the Annapolis Valley, Nova Scotia, especially in Annapolis County. The latter species was prevalent in orchards in the Okanagan and Kootenay districts, British Columbia. In the earlier part of the season the woolly apple aphid was more numerous in the Okanagan area than for many years, but by mid-August the infestations had been largely eliminated by the parasite Aphelinus mali Hald.

Tussock moth larvae caused damage in unsprayed or poorly sprayed orchards in parts of Nova Scotia, particularly in the western section of the Annapolis Valley.



## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

- Vermont. H. L. Bailey (August 25): Melanoplus sp. abundant in western counties, particularly Addison and Chittenden. In some sections second-crop grass and clover practically destroyed.
- Massachusetts. A. I. Bourne (August 22): Grasshoppers were very abundant and causing serious damage to fields of clover and to gardens in Ashfield, Franklin County, on August 8.
- Rhode Island. A. E. Stene (August 24): First complaint of extensive damage in a good many years. Apparently more than one species present.
- New York. N. Y. State Coll. Agr. News Letter (August 21): Extensive feeding, in some instances on the edge of cabbage fields next to alfalfa or other hay crops in Ontario County, western New York. Many dead hoppers seen in a cabbage field in Schuyler County, where control was used.
- Pennsylvania. L. E. Dills (August 15): Severe damage in Tioga County.
- General. K. D. Quarterman (August 24): Control operations against Dissosteira longipennis Thos. discontinued in New Mexico and Texas but still under way in Colorado. Roadside baiting for concentrations of Melanoplus mexicanus Sauss. continued in a few counties in the flight areas of Montana and Wyoming. Second generation reported in first three instars in northern Texas Panhandle and Oklahoma Panhandle. Oviposition in progress in all areas. Oviposition by the differential grasshopper, beginning from South Dakota and Nebraska southward. Adults of M. bivittatus Say reported as dying rapidly, following oviposition in Iowa, Nebraska, and South Dakota. A little baiting going on in Idaho, Iowa, Michigan, Minnesota, and Wisconsin. About 50 percent of M. femur-rubrum Deg. in the northern Mississippi Valley area still in nymphal stages. Adult survey in progress in all areas.
- Indiana. J. J. Davis (August 28): Not many reports of damage during the month. Report received from Fulton, north-central Indiana, indicating noticeable feeding on commercial celery plantings adjacent to uncultivated land.
- Illinois. W. P. Flint (August 19): Populations continue low, with only a very small area where injury is occurring. Parasites and predators are holding down the hoppers.
- Minnesota. H. Milliron (August 18): Reported as very abundant throughout the State, especially in the western counties.
- North Dakota. F. G. Butcher (August 22): Populations generally markedly reduced, except in the eastern and northern parts of the State. Crop injury severe only in isolated localities in the northeastern and west-central parts of the State and in crop areas immediately adjoining the northwestern part of the Missouri River. M. mexicanus is the dominant species throughout the State, with M. differentialis, M. femur-rubrum, M. bivittatus, M. packardii Scudd., and Camilla pellucida Scudd. conspicuous in various areas. Egg laying apparently normal for all species.

South Dakota. H. C. Severin (August 12): Damage is continuing, especially to corn, flax, and garden crops.

Nebraska. M. H. Swenk (August 15): Population greatly above normal over the entire State. Flights of migrating grasshoppers, largely M. mexicanus, occurred in western Nebraska, especially in the Panhandle area, but were not so conspicuous farther east as in recent years. In the more eastern part of central Nebraska, especially in the area from Howard to Polk Counties, north to Boone, and south to Clay and Fillmore Counties, there was much complaint of their concentrating in and defoliating not only fr and deciduous shade trees, but also evergreens and shrubs. During the second half of July there were local reports of grasshoppers dying in large numbers as a result of attack by Sarcophaga kellyi Aldr. One report of unusually efficient control by this parasite received from Logan County on July 21.

Oklahoma. C. F. Stiles (July 31): Situation much improved over the entire State and there has been very little crop damage. M. differentialis and M. bivittatus reported as damaging alfalfa in Kiowa and Harmon Counties. Sor row crops being damaged by various species in the Panhandle counties. Small flights of D. longipennis and M. mexicanus reported from Texas County. Control still under way in the Panhandle but other stations closed.

Utah. G. F. Knowlton (August 14): Control at its height in Cache, Weber, Salt Lake, and Utah Counties. Mating common, with M. mexicanus, M. bivittatus, M. packardii, and M. femur-rubrum usually the dominant species. Alfalfa and alfalfa seed most commonly injured now. Injury to tomato fruits occurring in Weber, Davis, Box Elder, Utah, and Salt Lake Counties. C. pellucida is injuring alfalfa and alfalfa seed crops at Benson, Cache County. Only in higher, cooler valleys are nymphs more numerous than adults. (August 18): Outbreaks of grasshoppers have occurred in New Harmony and Pine Valley, southern Utah. (August 25): Large numbers of C. pellucida are congregating on their breeding grounds near Ephraim and Wales, Sanpete County, central Utah.

Washington. V. Chapman (August 1): Losses held to a minimum in Okanogan County. Not found in several areas where they were last year, but located in some new communities. Apparently many of the hoppers in the Molson area were killed by extremely cold weather and unfavorable feeding conditions at hatching time. The later hoppers, largely M. mexicanus, have done very poorly, mostly being stunted and the numbers not sufficient to be economically serious. Peak of cycle about past.

California. G. H. Kallioetian (July 17): Damage by M. differentialis in a vineyard at Fowler, Fresno County, consisted of extreme defoliation, cane injury, and feeding on the bunches of early ripe grapes. (Det. by A. B. Gurney.)

#### MORMON CRICKET (Anabrus simplex Hald.)

Nebraska. M. H. Swenk (August 15): Reported as numerous about grain shocks in some fields as far east as Lincoln County the third week in July.



EUROPEAN EARWIG (Forficula auricularia L.)

Montana. H. B. Mills (July 30): Attacking flowers and gardens at Thompson Falls, Sanders County. Also reported from Lincoln County, but no specimens seen. Both counties in the northwestern part of Montana. First record of this pest in Montana.

Utah. G. F. Knowlton (August 12): Causing much annoyance in houses and entering fruits and ears of corn at Farmington, Davis County. Numerous complaints received.

Washington. E. J. Newcomer (August 18): More calls for information received than usual at Yakima. The fact that the last two winters have been mild has possibly caused a greater abundance.

WHITE GRUBS (Phyllophaga spp.)

Kentucky. M. L. Didlake (August 25): Counts, made in several bluegrass pastures during August, show that 1939 was a favorable year for the establishment of white grubs following the heavy beetle flight in the spring. Population range from 150,000 to 200,000 per acre, and some damage to sod is becoming noticeable.

GREEN JUNE BEETLE (Cotinis nitida L.)

Kentucky. M. L. Didlake (August 25): Peaches and grapes damaged during the first part of August.

Kansas. H. R. Bryson (July 29): Reports of this beetle as feeding on the leaves and fruit of peaches and other fruit trees received from Arkansas City and Topeka.

WIREWORMS (Elateridae)

Louisiana. O. T. Deen (July 3): Several larvae of Horistonotus sp. (possibly H. uhleri Horn) found attacking roots of cotton and corn severely at Ringgold, Bienville Parish.

Utah. G. F. Knowlton (August 21): At Hooper one field of tomatoes was reportedly one-fourth killed by wireworms.

California. M. W. Stone (August 23): Damage by the sugar-beet wireworm in a 50-acre field of lima beans near Somis, Ventura County, so severe that only half of stand remains. Beanfields in the Oxnard and Camarillo sections also damaged.

JAPANESE BEETLE (Popillia japonica Newm.)

Massachusetts. A. I. Bourne (August 22): More abundant than usual in much of the area of suburban Boston and in the vicinity of Springfield and West Springfield, in the Connecticut Valley. Very abundant on several of the large estates in the Berkshires, particularly in the section of Great Barrington and Egremont.



Rhode Island. A. E. Stene (August 24): Collections this year increased from 800,000 last year to over 3,000,000.

New York. M. D. Leonard (July 31): Beetles apparently reached their peak the latter part of the month at Flushing, but feeding seems to be about the same as reported earlier, owing undoubtedly to thorough and consistent control measures. (August 21): The number of beetles in traps at Flushing has steadily diminished during the last week or 10 days, and many reports indicate the beetle population as falling off in the quarantined areas.

R. E. Horsey (August 1): Reported in Brighton, near Rochester. They are uncommon and said to be the same as, or less than last year.

N. Y. State Coll. Agr. News Letter (August 21): In eastern New York sweet corn was seriously attacked for the first time in Westchester County especially in the lower end of the county. Damage said to be worse than that of the corn ear worm. Not uncommon to find from 20 to 50 beetles per ear. Early peaches, plums, and apples also seriously damaged. Control measures necessitated.

New Jersey. M. D. Leonard (July 27): Examination of one small section of Ridgewood showed light feeding, by only a few beetles. Reported as much more numerous than last year near golf courses and other open places, and a moderate amount of grub injury to some lawns reported.

#### ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

New York. C. H. Hadley (July): Reported in destructive numbers on Long Island. Adults found feeding on cabbage, cauliflower, and turnip plants near Port Jefferson and Setauket. No apparent injury. Larval injury to seedling corn and beans found earlier in the year. Some feeding on ornamental garden plants by adults near Southampton.

New Jersey. C. H. Hadley (July): Present in moderate numbers in the vicinity of Riverton and Palmyra. Observed about street lights at night in considerable numbers. A light trap caught from 26 to 214 per night.

M. D. Leonard (July 27): Two or three dozen at light in a small, enclosed porch at Ridgewood.

District of Columbia. Isabelle Smith (August 29): Very destructive for several weeks in some gardens in the northwest section of Washington. Practically all flowering plants damaged. Shasta daisy first attacked, but chrysanthemum, bergamot, phlox, and rose foliage also favored foods. Such shrubs as forsythia, snowball, and Japanese rose attacked. On a warm evening early in July 200 beetles were collected in one garden. Other collections ranged from 30 to 100 beetles per evening. Feeding decreasing at present but still noticeable. (Det. by E. A. Chapin.)

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

New York. C. H. Hadley (July): Various points on Long Island visited on July 13 and 14 to check on the status of this beetle. At points in Nassau County, where the beetle had been abundant in earlier years, it could not be found. No complaints received of turf injury. Never known to occur in destructive numbers in Suffolk County.

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. E. P. Felt (August 21): Found in large numbers in a house at New Canaan.

E. G. Hellyar (August 1): Annoying in a house in Norwichtown on July 28. (Det. by L. L. Buchanan.)

New York. C. A. Weigel (July 20): Reported as seriously injuring many flowers and garden plants, especially roses, at Wingdale, Dutchess County, in the Hudson River Valley. A serious nuisance in the house also. (Det. by L. L. Buchanan.)

BLISTER BEETLES (Meloidae)

New York. R. E. Horsey (July): Swarm of ash-gray blister beetle (Macrobasis unicolor Kby.) found on a planting of thermopsis on June 27 at Rochester. From four to five beetles on almost all the top leaves on the bed. Control measures successful. (Det. by H. S. Barber.)

North Carolina. C. S. Brimley (August): Epicauta marginata F. found attacking tomato and potato at Raleigh on August 8. Also found on tomato at Thomasville on July 31. Fig attacked at Durham on August 11.

South Carolina. J. G. Watts (August): E. marginata abundant and causing extensive defoliation of eggplant and E. vittata F. attacking foliage and fruits of tomato throughout the month at Blackville.

Alabama. J. M. Robinson (August 18): E. marginata reported on clematis vine at Yantley on August 17.

Tennessee. G. M. Bentley (August 10): E. pennsylvanica Deg. reported on turnip leaves at Chattanooga, Hamilton County.

Mississippi. C. Lyle (August 24): E. marginata found feeding on sunflower in Oktibbeha County on August 9. E. lemniscata F. very abundant on truck crops in southern Mississippi.

Ohio. E. W. Mendenhall (August 18): E. pennsylvanica causing considerable damage on gladiolus in Morrow County.

Michigan. R. Hutson (August 22): E. marginata reported as feeding on alfalfa and potato at Otsego.



- Minnesota. H. Milliron (August 18): M. unicolor abundant at Roseau. E. lemniscata reported as moderately abundant at Lakefield and E. sericans Lec. at Canby.
- Missouri. L. Haseman (August 25): More than the usual number of inquiries received in August, an aftermath of the last few years of grasshopper outbreaks.
- North Dakota. F. G. Butcher (August 22): Extensive injury to potato and garden throughout the entire western part of the State in recent weeks.
- South Dakota. H. C. Severin (August 12): Damage all over the State. Excessive damage to sugar beets in the irrigated section in the vicinities of Belle Fourche and Newell.
- Nebraska. M. H. Suenk (August 15): Large number of inquiries and complaints. E. lemniscata reported from Buffalo, Howard, Hall, Platte, Wayne, Dixon, Lancaster, Washington, and Sarpy Counties. E. cinerea Forst. a conspicuous pest during the latter half of July, especially in northeastern Nebraska, from Dixon and Platte to Douglas and Lancaster Counties. Unidentified blister beetles troublesome in Jefferson and Cass Counties.
- Kansas. H. R. Bryson (August 7): Epicauta spp. about as numerous as usual. Reports of injury received from Columbus, Augusta, Mulvane, Glasco, Jewell, and Rawlins.
- Oklahoma. F. A. Fenton (August 19): Found on tomato at Guthrie, Logan County.
- Idaho. W. E. Shull (August 18): More numerous and causing more damage than usual on shrubs and gardens in all northern counties.
- T. A. Brindley (August 1): Found feeding on flowers and shrubs in home gardens near Moscow.
- Washington. E. C. Durdle (August 16): In Clark County large numbers of Lytta stygica Lec. have attacked hedges and shrubbery and caused severe damage.
- L. G. Smith (August 16): Severe damage to garden flowers in the vicinity of Pullman.

FALL ARMYWORM (Laphygma frugiperda A. & S.)

- New York. N. Y. State Coll. Agr. News Letter (August 14): Infestation on corn noticed recently in several counties in eastern New York. Now causing crown injury on young plants. (August 21): Infestation has commenced on Long Island.
- Virginia. H. G. Walker and L. D. Anderson (August 25): Very destructive to many fields of late-planted corn in Norfolk and Princess Anne Counties and on the Eastern Shore. Reported as very destructive at White Stone, Lancaster County. Some fields totally destroyed.



Georgia. T. L. Bissell (August 11): More than the usual number of reports. Damage to corn reported as follows: On July 20 from Calhoun, northwestern Georgia; on July 21 from Experiment, central Georgia; on July 28 and August 11 from Spalding County, central Georgia; and, on July 26 from Henry County, central Georgia.

M. Murphey, Jr. (August 16): Collected feeding on corn. (Det. by C. Heinrich.)

E. E. Rogers (July 24): Completely ruined 20 acres of field corn at Valdosta. Every plant in the field showed considerable injury.

Florida. A. N. Tissot (August 24): Found in one field in Alachua County in a mixed infestation with the velvetbean caterpillar (Anticarsia gemmatilis Hbn.).

Alabama. J. M. Robinson (August 18): Reported as attacking sorghum at Auburn on August 16.

Mississippi. C. Lyle (August 24): Much injury to young corn during July and August. An unusually large acreage of late corn, owing to excessive rainfall during spring and early part of summer. Injury during August greater in the northern half of the State, although some complaints received from southern counties. Control measures used.

Louisiana. C. O. Eddy (August 23): Found feeding on corn, occurring in half-grown cornstalks at the rate of from 3 to 24 per stalk. (Det. by J. F. G. Clarke.)

Kentucky. M. L. Didlake (August 25): Found feeding on corn, although not in great numbers, at Bowling Green and California, Ky.

STALK BORER (Papaipema nebris nitela Guen.)

Massachusetts. A. I. Bourne (August 22): Infestation observed early in July in a nursery at Amherst. Larvae in considerable numbers were boring in the tender tips of seedling cherries, having evidently migrated from weedy growth along the borders of the planting, since all the damage was being done on the outside rows.

Oklahoma. F. A. Fenton (August 19): Found on chrysanthemums at Tulsa, Tulsa County.

BEEET WEBWORM (Loxostege sticticalis L.)

Minnesota. H. Milliron (August 18): Abundant at Baudette.

SAY'S STINKBUG (Chlorochroa sayi Stal)

Utah. C. J. Sorenson (August 19): Becoming moderately abundant in alfalfa-seed districts of Millard County on August 4.

Arizona. W. A. Stevenson (August 5): A decided increase in populations during the last week in the Marana district. Five cottonfields have reached the damage point, and control measures necessary.

# CEREAL AND FORAGE - CROP INSECTS

## WHEAT AND OTHER SMALL GRAINS

### HESSIAN FLY (Phytophaga destructor Say)

Ohio. J. S. Houser (July 31): The assembled data of the wheatfield survey show a sharp increase since 1938. Last year the average infestation of all fields examined was 10 percent, whereas this season it was 17.7 percent. Ashland County, in north-central Ohio, was the most heavily infested, with an average of 58 percent. Characteristic of the infestation this year was the unusually large number of fallen straws, accompanied by commercial damage.

Illinois. W. P. Flint (August 19): Annual survey covered most of the principal wheat-growing counties in the State. Infestation not heavy at any point. Rather light in the southern counties, especially in the south-central area. In the central and north-central areas the infestation is moderate but very general. Scarcely a field found in all this area which did not show a general, light infestation. Volunteer wheat abundant in all sections and showing a moderate infestation.

Nebraska. M. H. Swenk (August 15): Following extremely low population levels in southern Nebraska since the summer of 1934 and practically no important commercial damage since the winter wheat crop of 1932-33, hessian fly made a remarkable resurgence in the fall of 1938, which was continued moderate in the spring of 1939, so that now the population level in southeastern Nebraska appears to be approaching the danger point. Area concerned is the Missouri River counties, from Burt County southward, and along the Kansas line from Richardson to Jefferson Counties, including the other counties in the angle thus formed. In the lowlands along the Missouri River there was commercial damage in numerous fields during the spring of 1939. Far removed from this eastern infestation, the continued increase in winter-wheat acreage and continued exceptionally early fall sowing have produced an infestation in Cheyenne County, southwestern Nebraska, which gives some concern as to the 1939-40 crop.

### WHEAT JOINTWORM (Harmolita tritici Fitch)

Ohio. J. S. Houser (July 31): For the first time in nearly 30 years the wheat jointworm became a factor in some wheatfields. The highest infestations recorded were 29 and 31 percent in Licking and Knox Counties, respectively. Principal area of abundance in the north-central part of the State.

Illinois. W. P. Flint (August 19): Infestation very light.

### BLACK GRAIN STEM SAWFLY (Trachelus tabidus F.)

Pennsylvania. E. J. Udine (July 31): A general wheat survey consisted of examination of 5 fields in each county and 50 wheat culms in each field. A 3-percent infestation found in Franklin County.



Delaware. E. J. Udine (July 20): A 4-percent infestation found in New Castle County, 3-percent in Kent County, and less than 1-percent in Sussex County.

Maryland. E. J. Udine (July 31): Infestation by counties as follows: Cecil, 1 percent; Queen Anne's, 4 percent. In western Maryland infestation by counties as follows: Baltimore, 5 percent; Carroll, 20 percent; Montgomery, 5 percent; and Washington, 10 percent. Average for western Maryland, 8 percent.

Virginia. E. J. Udine and J. S. Pinckney (July): Infestation by counties as follows: Campbell, 1 percent; Essex, 2 percent; King George, 1 percent; Rockingham, 2 percent; and Westmoreland, 5 percent. Average for State, less than 1 percent--0.74.

Ohio. J. S. Houser (July 31): Intensity of infestation sharply declined, this being the third season of lessening damage since 1936, when two counties on the eastern border each averaged 68-percent infestation. The highest infestation was in Tuscarawas, 22 percent. Spread westward into new territory much less than for some years.

#### EUROPEAN WHEAT STEM SAWFLY (Cephus pygmaeus L.)

Pennsylvania. E. J. Udine (July 31): Survey consisted of examination of 5 wheat-fields in each county and 50 wheat culms in each field. Infestation by counties as follows: Adams, 6 percent; Bucks, 4 percent; Cumberland, 2 percent; Lehigh, 4 percent; Union, 2 percent; York, 3 percent; and Centre, 16 percent. Average infestation for State, 2.6 percent.

Maryland. E. J. Udine (July 31): Survey showed less than 1-percent infestation, centered in Cecil County.

#### GREEN BUG (Toxoptera graminum Rond.)

Kansas. R. H. Painter (August 8): Wheat plants severely damaged by the green bug, although the insects appear smaller than usual. This sort of damage occurring widely in central Kansas, and a good deal of it suspected in western Kansas, where green bugs were abundant last month. This is the first time in our experience that this insect has done damage so late in the season. (Det. by P. W. Mason.)

#### CORN

#### CHINCH BUG (Blissus leucopterus Say)

Illinois. W. P. Flint (August 19): Rains late in July and in the first half of August have, in most instances, prevented damage. Moderate numbers still present in spotted areas all over the State, but little damage done.

Kansas. H. R. Bryson (August 5): The second brood is causing considerable injury to late corn and sorghums in the eastern third of the State. Adults of the first generation flew into corn and sorghum fields instead of migrating in the usual manner as nymphs. Reports of abundance received from Scranton and



Manhattan. (August 20): Second generation maturing and more abundant at Manhattan and neighboring localities than for 10 years. An abundance of crabgrass, foxtail, and other grasses supporting enormous numbers of bugs which will go into hibernation. Presence of bugs of all stages indicate a partial third generation.

Oklahoma. R. G. Dahms (August 21): An extremely heavy infestation of third-generation nymphs in all sorghum fields in southwestern Oklahoma.

EUROPEAN CORN BORER (*Pyrausta nubilalis* Hbn.)

Connecticut. N. Turner (August 22): Nearly mature second-generation larvae present in maturing sweet corn ears. Infestation heavy but not in proportion to the enormous first generation. Many fields appear to be so heavily infested that the crop will be a total loss.

New York. N. Y. State Coll. Agr. News Letter (August 14): On Long Island the peak of second-generation moth abundance seems to be past, as well as the peak of second-generation egg laying. Abnormally dry weather is apparently hastening the end of activity. In Columbia and adjacent counties in eastern New York moth emergence is 80 to 90 percent complete in earliest plantings of corn and 30 to 50 percent complete in later plantings. Second-generation moth abundance apparently at its height, and new egg masses on late corn becoming increasingly numerous. Control begun last week. (August 21): Infestation on Long Island serious, many of the cobs containing pupae. Moths still abundant and new egg masses still being found in Columbia County, while injury from second-generation borers is beginning to show in the tassels of developing sweet corn. On Staten Island a reporter says that this is the first year in his observations of 7 years that noticeable damage has been caused to corn. Infestation in some fields has averaged about 40 borers per 100 plants. Larvae are rapidly entering the plants in Ulster County. Eggs still found but much less plentiful. A few large larvae and one pupa found in field corn on August 18. Moths still flying.

New Jersey. E. Kostal (August 5): Practically absent in the vicinity of Morganville, Monmouth County, after 2 years of heavy infestations.

Virginia. H. G. Walker and L. D. Anderson (August 25): A survey of Princess Anne County showed the insect to have spread along the sea coast from Pungo to the North Carolina line. All stages of the borer found in these fields. Infestation rather light, but found easily in all of the older plantings of corn examined. Infestation apparently very light or entirely absent in other parts of Princess Anne County.

North Carolina. H. G. Walker and L. D. Anderson (August 25): The European corn borer has been found on the mainland in the northeastern part of Currituck County and also on Kotts Island.

Indiana. J. J. Davis (August 28): A major pest in some of the eastern and north-eastern counties. There is a conspicuous increase over last year, when commercial damage occurred for the first time since the borer was first found in the State over 10 years ago. A definite increase in 2-generation borers. As many as 900 moths collected in a single night from 10 light traps in a cornfield in Allen County.

CORN LEAF APHID (Aphis maidis Fitch)

New York. N. Y. State Coll. Agr. News Letter (August 14): Several bad infestations on corn in Livingston County, western New York.

Pennsylvania. T. L. Guyton (August 9): Serious damage done to the upper parts of corn plants in York County. In many cases completely covered.

L. E. Dills (August 15): Generally distributed over most of the State and unusually abundant on field and sweet corn.

Maryland. E. N. Cory (August 7): Very heavy, general infestation, accompanied by parasites and predators, particularly ladybird beetles.

Virginia. J. R. Lintner (August 21): Field-corn tops and tassels show a condition more prominent than ordinarily seen in the vicinity of Leesburg, even in fields where corn ears are practically made. (Det. by P. W. Mason.)

Indiana. J. J. Davis (August 28): Very abundant in many areas of the State and somewhat harmful to corn, especially hybrid corn.

E. V. Walter (August 21): The first aphids infested with Lysiphlebus testaceipes Cress. observed on August 8 and only a very few observed to August 19. All species of coccinellids very scarce, possibly owing to heavy parasitization of them, both last year and this, by Dinocampus coccinellae Schr.

Minnesota. H. Milliron (August 18): Abundant on corn at Doran.

Nebraska. M. H. Swenk (August 15): Reported as severely attacking corn in Wayne and Burt Counties on July 22 and 27, respectively. On August 5, 7, and 9 came reports of heavy infestations on sorghums in Buffalo, Redwillow, and Hamilton Counties.

CORN LANTERNFLY (Peregrinus maidis Ashm.)

Georgia. T. L. Bissell (August 22): Thick on leaf bases of young corn at Woolsey central Georgia.

Mississippi. C. Lyle (August 24): Some injury to corn reported in the north-eastern section.

CORN ROOTWORM (Diabrotica longicornis Say)

Indiana. J. J. Davis (August 28): Damaged corn in southwestern Indiana by eating silks, preventing fertilization.



Tennessee. G. M. Bentley (July 25): Cotton plants damaged at Memphis, Shelby County.

Nebraska. M. H. Swenk (August 15): Damage to corn silks by adults reported on July 31 from Dodge County.

SEED-CORN BEETLE (Agonoderus lecontei Chaud.)

Minnesota. H. Milliron (August 18): Abundant throughout the State.

Kansas. H. R. Bryson (July 21): Reported as eating milo seed at Hugoton.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Indiana. E. V. Walter (August 21): Much more numerous than usual on dent and sweet corn.

A WEEVIL (Centrinaspis penicellus Hbst.)

Tennessee. G. M. Bentley (August 22): Larvae found in cornstalk at Decherd, south-central Tennessee. (Det. by W. H. Anderson.)

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (August 19): Survey made in the San Joaquin Valley on August 16. Larval count ranged from 0 to 71 per 100 sweeps of an insect net; adult count ranged from 0 to 5. Alfalfa fields at Pleasanton were surveyed on August 12 but no larvae or adults were collected. Field adjacent to the San Francisco bay surveyed on the same date, the larval count ranging from 8 to 46 and the adult count from 0 to 4.

ALFALFA CATERPILLAR (Colias eurytheme Bdv.)

Kansas. H. R. Bryson (August 25): About as abundant as usual. More than the usual number reported at Halstead on irrigated alfalfa.

Utah. G. F. Knowlton (August 15): Extremely abundant over alfalfa fields at Petersboro, Mendon, and Wellsville, Cache County.

California. A. E. Michelbacher (August 19): In the San Joaquin Valley on July 24 several fields in the vicinity of Westley were being damaged by larvae. Injury very localized and most of the fields in the northwestern part of the valley had very small populations. On August 16 populations in most fields were extremely small.

GARDEN WEBWORM (Loxostege similalis Guen.)

Indiana. J. J. Davis (August 28): Reported on August 18 as abundant and destructive to alfalfa in La Grange County for the third successive season.



Kansas. H. R. Bryson (August 25): Reported as destructive to alfalfa, which has been allowed to stand for seed production, at Halstead. Larvae destroy the tops of the plants and thus prevent the blossoms from forming.

PEA APHID (Macrosiphum pisi Kltb.)

Utah. G. F. Knowlton (August 14): Unusually abundant in early and mid-August in some young alfalfa fields in Cache County.

C. J. Sorenson (August 19): Moderately abundant in many alfalfa fields in Millard County.

CLOVER SEED CHALCID (Bruchophagus gibbus Boh.)

Oklahoma. R. G. Dahms (August 21): Unusually abundant in the alfalfa seed-producing section of southwestern Oklahoma.

CLOVER

CLOVER HAY WORM (Hypsopygia costalis F.)

Missouri. L. Haseman (August 25): During the last 2 weeks in August there was a fairly heavy flight of moths, as shown by bait-jar catches at Columbia.

COWPEAS

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Georgia. T. L. Bissell (August 10): Cowpeas at Blairsville, northeastern Georgia, found with a small number of eggs and grubs.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

North Carolina and South Carolina. J. S. Pinckney (August 18): During May the distribution was further increased in North Carolina by the addition of Beaufort, Pender, and Wilson Counties, and in South Carolina by the addition of Abbeville, Anderson, Chester, Greenwood, Laurens, and Union Counties.

Oregon. L. P. Rockwood (June 30): Volunteer hairy vetch in full bloom swept in alsike clover fields near Sisters, in the northwestern corner of Deschutes County, and three specimens found in the two fields swept near Cloverdale schoolhouse. This location is apparently about 40 miles farther south than the insect had been found in the Willamette Valley on the western side of the Cascade Range.

VELVETBEANS

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Florida. A. N. Tissot (August 24): Very destructive during the last few weeks. Velvetbeans being injured, but the greatest concern is occasioned by damage to peanuts. Apparently most prevalent in the region extending from Gainesville north to Lake City.

F. S. Chamberlin (August 19): Abundant in Gadsden County.

Louisiana. C. O. Eddy (August 23): The soybean caterpillar occurs in large numbers in small areas in southern Louisiana, near the Mississippi River.

SUGARCANE

A FROGHOPPER (Monecphora bicincta Say)

General. J. W. Ingram (August 5): Found in small numbers, attacking sugarcane in all plantings examined in Louisiana, Mississippi, Alabama, Georgia, and Florida. Unusually abundant in the vicinity of Quincy, Fla.

WEST-INDIAN SUGARCANE FULGORID (Saccharosydne saccharivora Westw.)

Georgia. J. W. Ingram and E. K. Bynum (August 2): Found for the first time in the southern Georgia sirup section. Not numerous enough to cause appreciable damage.

Florida. J. W. Ingram and E. K. Bynum (July 27): Scarce in southern Florida. It has at times caused heavy losses at Fellsmere.

YELLOW SUGARCANE APHID (Sipha flava Forbes)

Georgia. J. W. Ingram and E. K. Bynum (August 1): Unusually abundant in the vicinity of Cairo, but not abundant elsewhere in southern Georgia.

Florida. J. W. Ingram and E. K. Bynum (August 1): Not found in abundance in Florida, Alabama, or Louisiana.

SORGHUM

SORGHUM MIDGE (Contarinia sorghicola Coq.)

Georgia. T. L. Bissell (August 11): Sorghum heads blasted at Experiment, central Georgia. No insects present now.

FRUIT INSECTS

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

- New York. N. Y. State Coll. Agr. News Letter (August 7): In Niagara County, western New York, sweet cherries were killed after suffering from drought and winter injury.
- Maryland. E. N. Cory (August 15): Found in a cherry tree at Smithsburg.
- Virginia. A. M. Woodside (August 25): Reported as very common in Augusta County.
- Tennessee. G. M. Bentley (July 27): Damage caused to apple trees at Huntland, Franklin County.
- Idaho. F. H. Shirck (August 21): Severe damage noted on peach trees at Parma by a shot-hole borer, possibly this species.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

- Ohio. G. A. Runner (August 17): Abundant at Sandusky on fruit and shade trees.
- Indiana. J. J. Davis (August 28): Reported as partially defoliating apple at several places in the State.

RED-HUMPED CATERPILLAR (Schizura concinna A. & S.)

- Washington. L. G. Smith (August 16): Noted on August 13 defoliating the branches of apple trees and rose bushes in home gardens at Pullman.

PLUM LEAFHOPPER (Macropsis trinaculata Fitch)

- Tennessee. W. F. Turner (July 25): Taken on wild plum and peach at South Pittsburg, Marion County, on July 20. (Det. by P. W. Oman.)

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

- New York. N. Y. State Coll. Agr. News Letter (July 31): In Niagara County quite abundant where not well controlled.
- Delaware. E. P. Felt (August 21): Found in great abundance on plum at Wilmington.
- Maryland. E. N. Cory (August 9): Found on linden at Silver Spring.
- Nebraska. M. H. Swenk (August 15): Report from Dawson County on August 8 that apple trees had been killed.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

- Connecticut. P. Garman (August 24): Several bad outbreaks on apple in New Haven County.



New York. N. Y. State Coll. Agr. News Letter (July 31): Quite abundant on untreated prunes in Niagara County.

Michigan. R. Hutson (August 22): Scattered infestations over most of the State. Infestations observed at Mason, East Jordan, East Lansing, Dowagiac, Fenton, and Grand Rapids.

PACIFIC MITE (Paratetranychus pacificus McG.)

Washington. L. G. Smith (August 1): In the vicinity of the Prosser Experiment Station it is attacking raspberries and pears, the latter showing considerable damage.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (August 21): In bait traps at Poughkeepsie peak capture of adults occurred from July 31 through August 2, but relatively heavy captures continued through August 11. Number of moths captured has decreased daily since August 12. Injury is now severe in orchards untreated during August, where first-brood injury was prevalent.

N. Y. State Coll. Agr. News Letter (August 7): In western New York little damage noted in Monroe County from second brood, but in Niagara County fresh larval injury began to show up in the middle of the week on apples and a little earlier on pears. Larval injury noted in the lake zone, wherever the first brood was not controlled.

New Jersey. E. Kostal (August 5): Second brood has caused heavy infestations in Morganville, Monmouth County, even in treated orchards.

Delaware. L. A. Stearns (August 23): Considerable adult activity during the last week in July and the first week in August, with the peak, as indicated by bait-trap catches, on August 1. Infestation generally greater than in 1938.

Virginia. A. M. Woodside (August 21): Infestation in Augusta County considerably heavier than last year. Flight of first-brood moths still fairly heavy in the orchards.

Tennessee. G. M. Bentley (August 21): Found on apples at Columbia, Maury County.

Indiana. L. F. Steiner (August 23): First-brood adults coming to traps in the Vincennes area in uniformly large numbers since the peak of activity in July. Second-brood adult activity increasing rapidly since August 19. Injury to fruit well above normal. (August 24): The 1,328 moths captured August 22-23 may be the peak for the second brood. It was the largest catch since July 15 and slightly exceeds the maximum catch of spring-brood moths. Most of the many fresh injuries now appearing in well-sprayed orchards believed to be third-brood. Mature larvae leaving apples in increasingly large numbers only since August 19.

Missouri. L. Haseman (August 25): During the month throughout the State in well-sprayed orchards the build-up of the August brood has been much lighter than in recent years.

Arkansas. D. Isely (August 23): Much less abundant in northwestern Arkansas than has been the average for the last few years.

Missouri and Kansas. H. Baker (July 27): First-brood moths were first noticed in the field on June 26, and by July 5 entrances by second-brood worms were readily found. Bait-trap catches have remained at a high level since July 6, the peak catches being taken on July 12 and 22. (August 28): Third brood expected to be unusually heavy in northeastern Kansas and northwestern Missouri. Bait-trap catches of second-brood moths high, and third-brood larvae easy to find.

Oklahoma. F. A. Fenton (August 19): Larva found on pear at Muskogee, Muskogee County.

Utah. C. J. Sorenson (August 19): Moderately abundant in all apple- and pear-growing sections.

Washington. E. R. Van Leeuwen (August 18): At Yakima moth emergence, egg deposition, and hatching and cocooning of larvae have been increasing since about July 18. A peak of moth captures in baits occurred from August 10 to 17.

#### TWIG PRUNER (Hypermallus villosus F.)

Missouri and Kansas. H. Baker (July 27): Damage by this insect, which was so conspicuous in orchards of northeastern Kansas and northwestern Missouri in 1938, first noticed this year on July 14. Only a few scattered, severe twigs observed.

#### APPLE APHID (Aphis pomi Deg.)

New York. N. Y. State Coll. Agr. News Letter (August 7): In western New York apparently on the decline in most orchards in Monroe County, and well parasitized and becoming fewer in Niagara County.

Indiana. L. F. Steiner (August 10): Increasing in abundance in orchards in the Vincennes area that were not well sprayed.

#### BUFFALO TREEHOPPER (Ceresa bubalus F.)

Washington. E. J. Newcomer (August 22): Apparently more abundant than usual at Yakima, at least in some apple orchards.

#### APPLE LEAFHOPPERS (Cicadellidae)

Connecticut. P. Garman (August 24): Occasional apple orchards showing heavy to moderate infestations by Typhlocyba pomaria McA.



Missouri and Kansas. H. Baker (August 28): Second brood somewhat heavier than normal in most orchards in northeastern Kansas and northwestern Missouri. Dominant species determined as Erythroneura dowelli Beam., E. omani Beam. and E. lawsoniana Baker. Of these three species, E. dowelli usually predominates.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Massachusetts. A. I. Bourne (August 22): A very definite late emergence took place in the eastern part of the State following the rains of the last day of July.

Connecticut. P. Garman (August 24): About the usual abundance but large number of flies reported by some growers during August.

New York. N. Y. State Coll. Agr. News Letter (August 7): In Rockland County, eastern New York, flies still very plentiful in many orchards.

New Jersey. E. Kostal (August 5): Locally abundant at Morganville, Monmouth County, in early and midseason varieties of apples. Infestation on high-bush blueberry at Morganville increasing rapidly since August 1. Damage moderate to severe.

Michigan. R. Hutson (August 22): Specimens sent on apple from Royal Oak.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Delaware. L. A. Stearns (August 23): Elberta crop shows but little injury.

Georgia. O. I. Snapp (August 16): Adult population in central Georgia peach orchards now heavier than that of an average year. Second-generation adults have just begun to emerge in commercial orchards. Of the first generation 52.3 percent deposited eggs, 19 percent less than in 1938, and 18 percent less than in 1937, but about the same as in 1936. About half of the females of the first generation that emerged in 1939 did not deposit second-generation eggs during the season of their emergence.

Alabama. J. M. Robinson (August 18): Reported on peaches at Montgomery on August 5.

Mississippi. C. Lyle (August 24): Abundant on unsprayed peaches in the Meridian territory and in the southwestern section.

Tennessee. G. M. Bentley (August 9): Second brood causing damage to apples and late peaches at Arlington, Shelby County; 50-percent infestation.

Missouri. L. Haseman (August 25): Larvae quite abundant in August in central Missouri, although earlier in the season few larvae of the regular brood were found in stone fruits.



ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

- Delaware. L. A. Stearns (August 23): Little injury to the Elberta crop.
- Georgia. T. L. Bissell (August 21): Larvae killing young shoots of Photinia sp. at Experiment, central Georgia, but less numerous than last year. Heavy damage on young peach trees in Fayette County.
- Florida. A. N. Tissot (August 24): On August 9 infested nectarine twigs were sent in. Infested peach twigs sent in from Tallahassee on August 10.
- Mississippi. C. Lyle (August 24): Injured peach twigs received from Forrest, Jasper, Le Flore, and Pearl River Counties between July 31 and August 16. Reports of injury to peach received from the central section, the Meridian and southwestern districts, and Hancock County.
- Ohio. E. W. Mendenhall (August 15): Quite bad on peach, quince, and apple in central and southern Ohio.
- G. A. Runner (August 17): Twig injury early in August in the Sandusky and Lake Erie Island area was abundant in all peach orchards observed, the mid-summer infestation being apparently about normal, although variable.
- Indiana. L. F. Steiner (August 3): More moths appearing in traps this week than at any time this season in the Vincennes area. In 4 orchards and 310 traps from July 26 to August 3, inclusive, 331 were caught.
- Missouri. L. Haseman (August 25): Reported from practically all parts of the State where peaches are grown commercially, but in southeastern Missouri, where most of the peaches are grown, the Elberta crop matured without serious damage. Parasitization studies in that area most encouraging.

PEACH BORER (Conopia exitiosa Say)

- Georgia. O. I. Snapp (August 16): General normal infestation at Fort Valley, central Georgia. Heavy in those orchards not treated last year. Emergence has increased during the last week, and a number of moths observed ovipositing in peach orchards.
- Missouri. L. Haseman (August 25): Many inquiries as to control.

GREEN STINKBUG (Acrosternum hilare Say)

- Virginia. A. M. Woodside (August 22): Severe damage to peaches in parts of Amherst County. More than 60 individuals collected from one 4-year-old tree. Ninety percent of the fruit in parts of the orchards damaged by feeding. About 70 percent had reached the adult stage.
- W. J. Schoene (August 21): Numerous reports received regarding injury to lima beans. Apparently general, especially throughout the central part of the State, from Bedford east. One instance of severe injury to peach fruits in a large commercial orchard reported.

CHERRY

UGLY-NEST CATERPILLAR (Cacoecia cerasivorana Fitch)

Pennsylvania. L. E. Dills (July 25): Cherry tortrix abundant in Mifflin County.

CHERRY FRUITFLY (Rhagoletis cingulata Loew)

Oregon. S. C. Jones (August): Damage in Lane County not so severe as in 1937 or 1938. Infestation about normal in other Willamette Valley counties.

POTNAM'S SCALE (Aspidiotus ancylus Putn.)

Ohio. T. H. Parks (August 4): Infested cherry twigs sent from Cleveland. (Det. by H. Morrison.)

PEAR

A PEAR-BLIGHT BEETLE (Anisandrus pyri Peck)

Massachusetts. A. I. Bourne (August 22): Damaging a commercial planting in Fall River, in lower Bristol County on July 18.

PLUM

PLUM GOUGER (Anthonomus scutellaris Lec.)

Oklahoma. F. A. Fenton (August 19): On plum trees at Paden, Okfuskee County.

A MITE (Eupalopsis mali Ewing)

Washington. E. J. Newcomer (August 18): A mite, tentatively determined by E. A. McGregor as this species, reported recently. Investigations show it to be distributed generally throughout the Yakima Valley on Italian prune. When numerous it appears to cause some longitudinal rolling of the foliage. In the Yakima Valley it has been found on apple, pear, cherry, and apricot adjoining prune orchards, but appears to be on these fruits only as a straggler.

GRAPE

A BORER (Clytopleptus albofasciatus Lap.)

Ohio. G. A. Runner (August 17): This cerambycid, which has caused severe damage in a large vineyard in the Sandusky area during the last 2 years, again very abundant. The larvae are in the main trunks of older grapevines which show decayed spots. Agreeing with previous seasonal-history records, the period of heaviest emergence of the adults came late in June and early in July. Serious infestation apparently confined to one locality.

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. G. A. Runner (August 17): Egg deposition in the Sandusky area during the first week in August heavy in many vineyards. Young larvae of late brood beginning to enter the grape berries. The percentage of eggs parasitized by Trichogramma sp. at Vermilion is apparently low during the heaviest egg deposition of the second, or main, brood. Of 191 eggs examined on August 15 only 3 contained parasites that had reached the pupal stage.

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

Georgia. T. L. Bissell (August 24): Vines damaged at Griffin and Gray, central Georgia.

RAISIN MOTH (Ephestia figulilella Greg.)

California. G. H. Kaloostian (August 11): Taken on several varieties of grapes on the vines from Sanger, Fresno County, to Lindsay, Tulare County. Only larvae were present.

GRAPE SAWFLY (Erythraspides pygmaea Say)

Massachusetts. A. I. Bourne (August 22): A severe attack noted the first week in August in Hampshire County. Abundant enough to strip the foliage from a good many plantings.

GRAPE LEAFHOPPERS (Erythroneura spp.)

New York. N. Y. State Coll. Agr. News Letter (August 7): In Columbia County, eastern New York, nymphs of E. comes Say found on many of the leaves, some running as high as 50 per leaf. Most of them in early stages. Quite large numbers of adults in this vineyard.

Ohio. G. A. Runner (August 17): Many untreated vineyards in the Sandusky area show midsummer foliage damage, by various species of grape leafhopper, serious enough to interfere with normal ripening and coloring of the grapes.

A GRAPE FILBERT GALL (Schizomyia coryloides Walsh)

Michigan. R. Hutson (August 22): Submitted from Birmingham.

PECAN

PECAN WEEVIL (Curculio caryae Horn)

Georgia. T. L. Bissell (August 4): In central Georgia on July 28 a few weevils were found on pecan trees adjacent to woods at Yatesville and Thomaston. Weevil punctures found in a few dropped nuts at Milner on August 1 and on August 3 one weevil found at Woodbury. Present in small numbers and emerging slowly. (August 9): Abundant in pecans at Woodbury, central Georgia. (August 22): Numerous and causing pecan nuts to drop at Zebulon and Locust Grove, central Georgia.



PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Georgia. T. L. Bissell (August 3): Infested nuts brought in from Woodbury and insect reported as injurious for several years in one orchard. Nuts are small and were infested in May. This pest not noted in central Georgia before this year. (August 9): Considerable damage to several varieties of pecan at Woodbury. Some worms found in larger nuts.

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Georgia. T. L. Bissell (August 9): Abundant and injurious on pecan as usual at Woodbury. Few aphids present now. (August 22): Considerable damage on pecans at Zebulon and Locust Grove.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

New York. R. E. Horsey (August 10): A recently hatched brood found on black walnut at Rochester.

New Jersey. C. L. Griswold (August 19): Abundant in various localities of Morris County. Many trees completely defoliated.

Pennsylvania. L. E. Dills (August 23): Observed late in July, and in some sections many trees defoliated.

PINEAPPLE

A MITE (Stigmaeus floridanus Banks)

Florida. H. Spencer (August 22): Unusually abundant, slips from infested fields used for planting, having carried heavy infestations to new beds.

T R U C K - C R O P I N S E C T S

CUCUMBER BEETLES (Diabrotica spp.)

Connecticut. N. Turner (August 22): Late plantings of summer squash heavily infested by D. vittata F. early in August. Many plants killed.

Virginia. W. J. Schoene (August 21): Injury by corn rootworm (D. duodecimpuncta F.) to peanuts at Holland, and damage to about 20 percent observed in one field. This is an unusual peanut pest in that it causes serious injury at late intervals.

Mississippi. C. Lyle (August 24): D. vittata reported as seriously affecting the market value of watermelons in the northeastern section by feeding on the outer skin. Specimens received from Hinds County, where watermelons and cantaloups had been injured. Banded cucumber beetle (D. balteata Lec.) received from Jones County on August 18 with information that serious injury had been caused to dahlia flowers. Specimens received from Hinds

County where watermelons and cantaloups had been injured.

Louisiana. C. O. Eddy (August 23): D. balteata has been very destructive on soybeans throughout Louisiana.

Kansas. H. R. Bryson (August 25): Southern corn rootworm more abundant this year than for the last 3 years.

Utah. G. F. Knowlton and A. B. Call (August 16): The pale variety of the 12-spotted cucumber beetle (D. duodecimpunctata tenella Lec.) has damaged cucumbers and other small vegetables in Washington County localities.

Oregon. G. R. Ferguson (August): Adults of the western 12-spotted beetle (D. soror Lec.) have caused considerable damage to several crops during the last month in the Willamette Valley. Damage to corn, particularly sweet corn, rather severe in some localities. Damage to beans has continued to be serious. Alfalfa and clover fields are supporting large populations of the adults and suffering considerable injury. Severe injury to several gardens reported.

FLEA BEETLES (Phyllotreta spp.)

New York. N. Y. State Coll. Agr. News Letter (July 31): Flea beetles reported as eating 20 outer rows of cabbage in a field in Orleans County, western New York. Most of them were P. aerea Allard. The other species is P. zimmermani Crotch. (Det. by H. S. Barber.)

Tennessee. G. M. Bentley (August 7): Heavy infestation of striped flea beetle (P. vittata F.) on cowpeas at Oakland and Selmer, Fayette and McNairy Counties.

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Oregon. G. R. Ferguson (August): Results from a survey of fiber flax, grown in the Willamette Valley in 1939, based on samples from 50 fields, showed that 8.5 percent of the flax was injured by larvae of the omnivorous leaf tier. Injury to strawberries appeared to be general and in some fields ranged from 25 to 50 percent of injured or wormy berries. Injury to vetch, peas, nursery stock, and other crops apparently more widespread and severe than in previous years.

POTATO APHID (Macrosiphum solanifolii Ashm.)

Indiana. J. J. Davis (August 28): Abundant on tomatoes in central Indiana.

Utah. G. F. Knowlton (August 14): Wild geranium plants heavily infested in Logan Canyon during the latter part of July and early in August.

California. J. C. Elmore (April 20): Attacking summer squash in the Palos Verdes-San Pedro hills, Los Angeles County. Numerous, necessitating treatment. (Det. by P. W. Mason.)



SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Mississippi. C. Lyle (August 24): Reported as numerous on cowpeas in the southeastern section and on lima beans in Pike County. Specimens received from Hinds and Holmes Counties the last week in July.

FALSE CHINCH BUG (Nysius ericae Schill.)

South Dakota. H. C. Severin (August 12): Much damage to bush fruits, strawberries, and garden truck in the Black Hills area.

Texas. R. K. Fletcher (August 12): Reported from Dallas County as severely injuring the seed pods of flax.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Nebraska. E. J. McNerney (August 7): In a car of potatoes out of Kearney on August 1 were found hundreds of live beetles, crawling on the bags when the car was broken.

Washington. E. J. Newcomer (August 18): Abundant in home gardens at Yakima.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Pennsylvania. L. E. Dills (August 23): Abundant late in July and early in August in the central and northeastern counties.

Ohio. N. F. Howard (August): During the week beginning August 14, flea beetles, chiefly E. cucumeris, became extremely numerous on eggplant at South Point and on potatoes at Columbus.

Minnesota. H. Milliron (August 18): Moderately abundant at Madison Lake.

North Dakota. J. A. Munro (August 22): Very abundant in potato fields at Fargo and northwards to Grand Forks. Observations made at Grafton, Park River, and Cavalier indicated very light infestations.

HORNWORMS (Protoparce spp.)

Vermont. H. L. Bailey (August 25): Hornworms, P. quinquemaculata Haw. and P. sexta Johan., appearing in unusual abundance, particularly in Washington and Chittenden Counties. P. quinquemaculata greatly predominates among specimens observed.

New York. N. Y. State Coll. Agr. News Letter (August 7): Tomato hornworms abundant. Reported from four counties during the last week as infesting tomatoes and, in one instance in Onondaga County, western New York, as infesting tobacco. (August 21): In western New York tomato worms are very abundant and destructive in Erie, Wayne, and Niagara Counties. Control measures necessitated.



Kansas. H. R. Bryson (August 20): Reports from Jewell, Manhattan, and Hutchinson indicate the tomato worms as destructive.

Utah. H. E. Dorst (August 3): Approximately 25 acres of tomatoes near Warm Springs, northern Utah, almost completely defoliated. Only occasional feeding observed in other tomato areas of the State.

G. F. Knowlton (August 5): Tomato foliage damaged at Logan, Providence, and Lewiston.

TOMATO PINWORM (Keiferia lycopersicella Busck)

Pennsylvania. C. A. Thomas (August 24): No specimens found during careful examination of tomato plants in Pennsylvania greenhouses and gardens during last spring and summer.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Connecticut. N. Turner (August 22): Infestation on potatoes continues to be very heavy in most localities.

New York. N. Y. State Coll. Agr. News Letter (August 7): On Long Island leafhoppers numerous lately, and foliage injured by their migration from field to field. (August 14): In western New York heavy populations and noticeable injury found in Genesee County, while in Jefferson and Franklin Counties they are very scarce.

Minnesota. H. Milliron and assistants (August 18): Very abundant generally.

North Dakota. J. A. Munro (August 22): About 20 nymphs per potato plant at Fargo and about 2 per plant at Park River, according to counts made during the last week.

POTATO AND TOMATO PSYLLID (Paratrioza cockerelli Sulc)

North Dakota. J. A. Munro (August 22): Present in moderate numbers throughout a large part of the State. Observations on July 23, 24, 29, and 30 revealed adults as present on potatoes in gardens and small fields in or near Beach, Taylor, New Salem, Bismarck, Medina, Jamestown, and Valley City. Observations on August 10-12 revealed them as present in the vicinities of Mandan, Baldwin, Wilton, Washburn, Cole Harbor, Minot, Granville, Towner, Knox, Leeds, Devils Lake, Lakota, and Arvilla. Unverified reports indicate them as present again this season in the northwestern area in which they occurred last season. Observations indicate that they are mainly distributed west of the main potato-growing area of the Red River Valley.

South Dakota. H. C. Severin (August 12): Some damage to potatoes and tomatoes in the Black Hills and surrounding area.

Nebraska. M. H. Swenk (August 15): Not proving very troublesome this season, greatly in contrast with 1938. From Dawes County on August 1 came the only complaint received this year.

A MEALYBUG (Pseudococcus solani Ckll.)

Nebraska. M. H. Swenk (August 15): Found attacking the roots of potato plants Hall County on August 10.

NORTHERN MOLE CRICKET (Gryllotalpa hexadactyla Perty)

Nebraska. M. H. Swenk (August 15): Specimens taken from a potato patch in Holt County received on August 14. Specimens sent in from Platte and Sheridan Counties on July 31 and August 14, respectively.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Connecticut. N. Turner (August 22): First-generation adults have caused serious damage to garden beans.

New York. N. Y. State Coll. Agr. News Letter (August 7): In the pupal or first generation adult stages in up-State New York. More widespread than a year ago, but first-generation larval injury not as severe. Numerous beetles have developed in the last 3 weeks. (August 14): In western New York observed in Livingston, Ontario, and Genesee Counties. It was found for the first time in Jefferson County on August 9. (August 21): Second-generation eggs seen in small numbers in Seneca County on August 18 and in Tompkins County on August 20, the latter in a field of beans that were all but destroyed by first-generation grubs. This 4-acre field now covered with beetles. On Long Island the second generation has been slow to develop. Egg laying continuing and the first eggs have hatched. Pentatomids preying on the larvae. In Ulster County second-generation larvae beginning to cause damage. In western New York second brood hatching in Allegany and Genesee Counties, but in Ontario County very few beetles generally and no eggs found.

Virginia. H. G. Walker and L. D. Anderson (August 25): A great deal of damage in some beanfields and in a great many home gardens at Norfolk.

South Carolina. J. G. Watts (August): Noticeably less abundant than usual late this summer at Blackville.

Georgia. T. L. Bissell (August 11): Much damage at Griffin, central Georgia, in the last 2 weeks to old, neglected beans. Cowpeas show light damage. A few pupae noted, denoting a generation reared.

O. I. Snapp (August 16): Infestation at Fort Valley, central Georgia, moderate and about that of an average year.

D. F. Farlinger (August 19): Severe injury on snap and lima beans in field and garden in Appling and several adjacent counties. Beetle rapidly spreading over the coastal-plain section of Georgia.

E. E. Rogers (August 21): Local gardeners at Valdosta complaining of exceptional injury on late beans.



Florida. F. S. Chamberlin (August 19): Continuing very abundant in Gadsden County.

Mississippi. C. Lyle (August 24): Heavy damage to late beans and cowpeas in the northeastern section, the Meridian district, and in Yalobusha County. Specimens received from Chickasaw, Clarke, Lauderdale, Oktibbeha, and Newton Counties between July 25 and August 18. A report from Webster County states that all beans in the town of Eupora had been destroyed.

Ohio. N. F. Howard (August 22): Second generation numerous and injurious at South Point. Untreated beans defoliated.

E. W. Mendenhall (August 15): Destructive in central Ohio. Some bean patches totally destroyed.

Indiana. J. J. Davis (August 28): Abundant and destructive in many parts if not in all of Indiana.

Michigan. R. Hutson (August 22): Observed in many counties in the southern half of the Lower Peninsula, as far north as Midland County.

Utah. G. F. Knowlton (August 15): Considerable damage to garden beans and less to field beans in Carbon County, as compared with injury last year.

BEAN LEAF BEETLE (*Cerotoma trifurcata* Forst.)

Pennsylvania. L. E. Dills (August 23): Damage occasionally done in the central part of the State early in August.

Georgia. T. L. Bissell (August 7): Larvae on cowpea roots at Experiment, central Georgia, mining the main root and killing plants.

Mississippi. C. Lyle (August 24): Said to be causing considerable damage to late beans in the southeastern section.

Louisiana. C. O. Eddy (August 23): Very destructive on soybeans throughout Louisiana.

Arkansas. D. Isely (August 23): Extensive injury to soybeans reported from Pulaski County, central Arkansas.

PEAS

Correction

Washington. L. G. Smith (August 17): Under pea weevil (*Bruchus pisorum* L.) in the Insect Pest Survey Bulletin, dated August 1, 1939, (v. 19, No. 6, p. 386), in the second sentence of the report from Washington it should read "Willapa Valley, Pacific County," rather than "Pierce County."



CABBAGE

CABBAGE SEED WEEVIL (Ceutorhynchus assimilis Payk.)

Washington. E. P. Breakey (August 1): Specimens of cabbage seed pods which have been attacked were received from Wahkiakum County. Pods contained well-developed larvae, although damage was apparently light.

L. G. Smith (August 16): After visiting a number of cabbage seed fields in Skagit County, infestation was estimated to be approximately 25 percent. Only a small number of seeds in each pod damaged. Nearly all of the larvae have matured and emerged from the pods. Little evidence of parasitization.

IMPORTED CABBAGE WORM (Pieris rapae L.)

Connecticut. N. Turner (August 22): Universally present but little damage caused.

New York. N. Y. State Coll. Agr. News Letter (August 28): Less injury to cabbage in western New York than at any time in the last 4 or 5 years.

CABBAGE LOOPER (Autographa brassicae Riley)

New York. N. Y. State Coll. Agr. News Letter (August 21): A fresh emergence of cabbage loopers on Long Island during the last week. On Staten Island two fields of cabbage were almost completely destroyed before control measures were started.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Connecticut. R. L. Beard (August 24): Two specimens taken at Mount Carmel, this being the only record in Connecticut since 1910.

Maryland. E. N. Cory (August 9): Found on cabbage at Cumberland.

Florida. A. N. Tissot (August 24): Mustard, turnips, and other greens being severely injured at Tampa on August 2.

Mississippi. C. Lyle (August 24): Specimens received from Hinds County on July 31 and from Washington County on August 19. Reported as rather abundant over the southern third of the State and in the northeastern section. Collards, cabbage, and related crops infested.

Kentucky. M. L. Didlake (August 25): Abundant at Moreland.

Nebraska. M. H. Swenk (August 15): Found in Kearney County on August 14, when they were in about the fourth or fifth instar.

Kansas. H. R. Bryson (August 25): Reported as destructive in southeastern Kansas and at Hutchinson on turnips and cabbage. More noticed at Manhattan than ordinarily seen, but not abundant enough to cause damage.

Texas. R. K. Fletcher (August 12): Severe injury to turnip in Anderson County.

APHIDS (Aphidae)

New York. H. Glasgow (August 18): Cabbage aphids (Brevicoryne brassicae L.) more abundant and destructive in western New York cabbage-growing districts than for years.

N. Y. State Coll. Agr. News Letter (August 28): Cabbage aphids very prevalent in many plantings and marked injury caused in many cases. Peak apparently reached at present, and it is not increasing at the rate of about a week ago.

Pennsylvania. L. E. Dills (August 22): Cabbage aphids abundant in dry areas of the State late in July and early in August.

SQUASH

SQUASH BORER (Melittia satyriniformis Hbn.)

Connecticut. N. Turner (August 22): Locally very abundant. Many fields of early summer squash heavily infested and vines killed.

New York. N. Y. State Coll. Agr. News Letter (August 7): In Monroe County, western New York, considerably more abundant than usual and causing considerable loss in a number of plantings. (August 21): On Long Island observed not to be as destructive as usual.

Michigan. R. Hutson (August 22): Infestations observed at Lake, Allen, and Port Huron.

South Carolina. J. G. Watts (July 24): One larva found on cantaloup at Blackville

SQUASH BUG (Anasa tristis Deg.)

New York. N. Y. State Coll. Agr. News Letter (August 7): Some infestations found in Steuben and Monroe Counties, western New York. (August 14): Eggs found occasionally on squash on Long Island, and nymphs not very numerous. (August 21): Late brood found in fair numbers in Orleans County.

Louisiana. C. O. Eddy (August 23): Extremely abundant on squash.

Michigan. R. Hutson (August 22): Numerous at Lansing, Lake Orion, Pontiac, Owosso, and Grand Rapids.

Minnesota. H. Milliron (August 18): Abundant on pumpkin at West Concord.

Nebraska. M. H. Swenk (August 15): Reported as attacking cucurbits in Lincoln, Custer, Lancaster, Douglas, and Sarpy Counties during the period July 20 to August 5.

Kansas. H. R. Bryson (August 25): Unusually abundant and doing considerable damage to squash and pumpkins in the truck district.

Utah. G. F. Knowlton (August): Injury throughout the month in Cache, Davis, and Weber Counties, northern Utah, in Carbon County, east-central Utah, and Washington County, southern Utah.

Washington. L. G. Smith (August 1): Observed in the Pasco area as causing some damage on nearly mature squash. Eggs and first- and second-instar nymphs the most abundant stages.

### MELONS

#### SQUASH BEETLE (Epilachna borealis F.)

Virginia. H. G. Walker and L. D. Anderson (August 25): Rather abundant in a number of watermelon fields near Smithfield late in July and early in August.

#### MELONWORMS (Diaphania spp.)

South Carolina. J. G. Watts (August): The first record of the season at Blackville for the melonworm (D. hyalinata L.) was on July 25. Larvae very abundant on late cantaloups and cucumbers, to which they are causing extensive defoliation. Practically 100 percent of cantaloups and cucumbers infested with pickleworm (D. nitidalis Stoll).

Mississippi. C. Lyle (August 24): D. nitidalis reported from Warren County on 20 in squash. Unusually numerous in the southern district and at State College.

Kentucky. M. L. Didlake (August 25): Gourds attacked at Lexington by D. nitidalis.

#### MELON APHID (Aphis gossypii Glov.)

Delaware. L. A. Stearns (August 10): Severe infestation, with characteristic injury and considerable crop loss, to cantaloups in the Felton-Viola section of Kent County.

Indiana. J. J. Davis (August 28): Abundant and destructive to melons generally over the State.

Minnesota. H. Milliron (August 18): Very abundant on cucumber at Shokopee.

Kansas. H. R. Bryson (August 25): Where control measures not applied effectively melon and cucumber vines destroyed.

Utah. G. F. Knowlton and F. C. Harmston (August 4): Cantaloups at Green River damaged and watermelon foliage at Taylor and Riverdale.



ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

- South Carolina. J. G. Watts (August): Noticeably less abundant than usual at Blackville.
- Ohio. E. W. Mendenhall (August 15): Considerable damage to asparagus in Clark County.
- Minnesota. H. Milliron (August 18): C. duodecimpunctata L. not very abundant on asparagus at Saint Anthony Park.
- Utah. G. F. Knowlton (August 14): Adults abundant and mating at Marriott, Farmington, Syracuse, and Sunset. Slugs and some eggs present, and moderate injury to many plants.
- Washington. R. D. Eichman (August 22): Light damage to asparagus in Prosser and Walla Walla. Many adults found on the plants, eggs abundant, but few larva present. Control measures generally used.

CELERY

GREENHOUSE LEAF TIER (Phlyctaenia rubigalis Guen.)

- Indiana. J. J. Davis (August 28): Some injury to celery at Fulton, north-central Indiana.

EGGPLANT

POTATO STALK BORER (Trichobaris trinotata Say).

- Ohio. N. F. Howard (August 7): Specimens found in eggplant at South Point. It destroyed most of the plants in one planting of  $\frac{1}{4}$  or  $\frac{1}{3}$  acre and has accounted for the loss of plants in some other plantings. (Det. by L. L. Buchanan.) Triaspis curculionis Fitch, a braconid, was collected on this weevil on August 1. (Det. by C. F. W. Muesebeck.)

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

- Connecticut. N. Turner (August 22): As onions were killed, migrating thrips fed heavily on cabbage and cauliflower plants. Some damage.
- New York. N. Y. State Coll. Agr. News Letter (August 7): In eastern New York on Long Island and in Orange County thrips have been quite injurious to onions but are now decreasing. (August 14): Infestations very heavy in Genesee County on maturing onions.
- South Dakota. H. C. Severin (August 12): Especially abundant in the Black Hills territory and considerable damage caused.

RHUBARB

RHUBARB CURCULIO (Lixus concavus Say)

Nebraska. M. H. Swenk (August 15): Reported as attacking rhubarb in Boone County on July 17.

A TERMITE (Reticulitermes tibialis Banks)

Nebraska. M. H. Swenk (August 15): Rhubarb plants in Nuckolls County reported being attacked on August 2.

LETTUCE

SIX-SPOTTED LEAFHOPPER (Macrosteles divisus Uhl.)

New York. N. Y. State Coll. Agr. News Letter (August 14): At Gabriels, Franklin County, abundant on lettuce, with some yellows evident. (August 21): This is the first season on Staten Island that growers have asked for control information for this insect on escarole and endive. In severe infestation leaf curling and stunting resulted, in addition to high percentages of yellows.

SWEET CORN

CORN EAR WORM (Heliothis arnigera Hbn.)

Connecticut. N. Turner (August 22): In southern Connecticut one large field of late sweet corn was 15-percent infested. Another 2-acre field at least 75 percent infested. Apparently more abundant than usual.

New York. N. Y. State Coll. Agr. News Letter (August 21): On Long Island moths are abundant, and most ears infested. More numerous than usual on Staten Island. Infestation runs about 20 percent. In Rockland, Westchester, and Ulster Counties infestations run from 15 to 30 percent. In western New York generally present in Erie and Orleans Counties.

Pennsylvania. L. E. Dills (July 19): Fairly abundant on some early plantings of sweet corn. Damage severe.

Virginia. H. G. Walker and L. D. Anderson (August 25): Very scarce on sweet corn maturing late in July and early in August. Moths and eggs very abundant in a field of corn just silking at Norfolk.

Indiana. E. V. Walter (August 21): Examination of sweet corn harvested in test plots at La Fayette during the period August 7-19 shows slightly less than percent of the ears infested. Earlier corn had a slightly heavier infestation.

Kentucky. M. L. Didlake (August 25): Sweet corn harvested on August 8 at Lexington had an infestation of 35 percent.

- Mississippi. C. Lyle (August 24): Heavy damage to corn and tomatoes reported in the Meridian district.
- Missouri. L. Hasenan (August 25): Since the middle of August sweet corn at Columbia has been showing a very heavy infestation, although it was light earlier in the season.
- Nebraska. M. H. Swenk (August 15): Complained of as doing serious damage to sweet corn in Harlan County during the second week in August.
- Utah. G. F. Knowlton (August 25): Extensive damage to sweet corn in Utah, Box Elder, and Davis Counties.
- Washington. L. G. Smith (August 22): At Prosser moths quite numerous in lima bean fields. Some damage to this crop noted last year. Abundant in home gardens at Yakima.
- R. S. Lehman (August 21): Noted as feeding on pods of string beans planted next to corn at Walla Walla, where it has also been very injurious to corn all season.

#### Correction

- Washington. L. G. Smith (August 17): In the Insect Pest Survey Bulletin dated August 1, 1939 (v. 19, No. 6, p. 390) the Washington report under strawberry crown borer (Tyloderma fragariae Riley) should have appeared under the strawberry crown miner (Aristotelia fragariae Busck).

#### PEPPER

##### A BURROWER BUG (Pangaeus bilineatus Say)

- Florida. A. N. Tissot (August 24): Pepper seed beds at Fort Myers being severely injured on August 2. Beds mulched with grass and weeds, which probably was the cause of the bugs' congregating in such large numbers.

#### C O T T O N I N S E C T S

##### BOLL WEEVIL (Anthonomus grandis Boh.)

- Virginia. W. J. Schoene (August 21): Reported as causing serious losses in Greenville, Southampton, and Nansemond Counties. Injury greater than for some years.
- South Carolina. F. F. Bondy, et al. (August 26): Moving about a great deal in Florence County, largely owing to lack of food. Apparently about normal number in the fields.
- Georgia. L. W. Morgan (August 25): Damage continues in untreated fields in Lowndes and Echols Counties and, since there are no squares on which to feed, all damage is to grown bolls.



P. M. Gilmer, et al. (August 5): Infestation increased during the week in Cook, Berrien, and Tift Counties. Untreated cotton showed infestation of approximately 90 percent. (August 12): Apparently the peak of mid-summer migration in Tift, Cook, Berrien, Lowndes, and Echols Counties is now past, and weevils, while still entering fields in large numbers, are not quite so numerous as in previous weeks. Plentiful in all fields and may be found, even in well-treated cotton, in some 10 to 20 percent of f examined. (August 19): Damage on untreated fields continued to rise, b on treated fields, while rising, did so at a much slower rate than previo ly. Boll damage has risen somewhat, but on plats with a fair number of squares, infestation has risen only to about 25 percent.

O. I. Snapp (August 16): Infestation at Fort Valley, central Georgia, less than that of an average year.

Florida. C. S. Rude and assistants (August 5): Twenty-seven fields examined d ing the week in Alachua, Gilchrist, Marion, Putnam, Union, and Lake Counties. Three fields in which infestation had not been found this season were found infested, but punctured dsquares were found at only one point each case. For the week ended August 7, 1937, infestation averaged 32.2 percent; for the week ending August 6, 1938, it averaged 73 percent; and this year the average is 49 percent. (August 12): Only 16 fields inspected during the week. In most fields visited the squares left on the plant have been practically consumed. Egg deposition apparently occurring only in bolls. In most fields adults are feeding on the boll walls, even mature bolls being affected. Average infestation was 50 percent, with a range of from 4 to 97 percent. (August 19): Infestation ranges from 55 to 100 percent in fields examined this week. In only three or four of the fields were infestations below 90 percent. Increase is partly owing to the small number of squares and the small bolls. Infestation about the same as last year. (August 26): Twenty-five fields visited during the week. In most fields infestation is heavy, ranging from 80 to 100 percent in instances where it was possible to make counts. Damage to bolls showing up in most fields, estimated as from insignificant to 50 percent. Infestation, as compared to that for the same period last year, is about the same except in Lake County, where last season it ranged from 2 to 4 percent and this year from 10 to 95 percent.

Alabama. J. M. Robinson (August 18): Abundant over entire State.

Mississippi. C. Lyle (August 24): Very abundant throughout the season, and considerable damage done to late cotton where no control measures were applied. Infestation in general about the same as in 1938.

Louisiana. R. C. Gaines and assistants (August 19): In Madison Parish at this time in 1938, records were possible on only 1 test, averaging 91.5 percent of punctured squares. Records made this year on 17 tests, averaging 81.2 percent of punctured squares and ranging from 64.3 to 90.7 percent.

C. O. Eddy (August 23): Infestation still very high on late cotton.

Oklahoma. C. F. Stiles (July 31): The hot, dry weather of the last 2 weeks has checked infestations to some extent. (August 24): Reported in unusually large numbers in Seminole County.

Texas. F. L. Thomas (August 1): Hot weather and rapidly maturing cotton probably responsible for holding weevils in check. Infestation in Burleson, Falls, Limestone, and McLennan Counties has appeared to increase, being due to the scarcity of squares. (August 23): Local showers, spotted in occurrence, rather general throughout the State and favorable for multiplication. Movement of weevils to fruiting cotton has been heavy. Even young bolls being severely damaged in many fields, especially in central and west-central Texas.

C. R. Parencia and S. E. Jones (August 12): Increasing rapidly in all but a few fields in Calhoun County. In many fields practically every square is punctured. Some squares have four to five egg punctures.

K. P. Ewing, et al. (August 26): Very numerous in most of the late-planted cotton in McLennan, Falls, and Limestone Counties during the week. In one field, consisting of approximately 500 acres of early planted cotton examined this week weevils had totally ruined about two-thirds of the bolls. Yield estimated as reduced from approximately  $\frac{1}{2}$  to  $\frac{1}{5}$  bale per acre.

BOLLWORM (Heliothis ornigera Hbn.)

Georgia. P. M. Gilmer, et al. (August 19): Damage has increased markedly over last week in Tift, Berrien, Cook, Lowndes, and Echols Counties. In some fields 8 to 10 percent of the bolls attacked. Small larvae still plentiful.

T. Thompson (August 22): Apparently very severe, local damage in one field of cotton in Seminole County. Observed on August 4.

Florida. A. N. Tissot (August 24): Sent in from Tallahassee on August 14 and from DeFuniak Springs on August 21. At the latter place larvae reported as having destroyed half of the bolls in some fields.

C. S. Rude and assistants (August 26): Still doing a good deal of damage to bolls in many fields in Alachua, Gilchrist, Marion, and Lake Counties.

Alabama. J. M. Robinson (August 18): Found on cotton at Moulton and Geneva on August 14.

Mississippi. C. Lyle (August 24): Light infestations reported from the northeastern section and the Meridian district. Specimens feeding in cotton bolls received from Covington, Holmes, Pontotoc, Quitman, and Walthall Counties between July 31 and August 17.

R. L. McGarr, et al. (August 5): Noticeable damage in some of the experimental cuts in Oktibbeha County. Damage in this section more general than during any of the last few years, or at least since 1934.



E. W. Dunnam, et al. (August 19): Present in Washington County during the entire season, but not much damage done.

Texas. K. P. Ewing, et al. (August 5): In examining 3,900 cotton terminals in fields of late-planted cotton in the vicinity of Waco, McLennan County, during the week, 903 eggs were found, the number of eggs per 100 terminal buds in these fields ranging from 5.0 to 72.3, with an average of 23.2 per 100 terminals. Average per 100 terminals for last week was 9.3 and the week ending July 22 was 7.4, showing a very marked increase in oviposition in late-planted cotton.

C. R. Parencia and S. E. Jones (August 5): Heavy infestation observed in one field in Calhoun County.

A. J. Chapman (August 12): Considerable damage in spotted locations in Presidio County. Damage more apparent in the later planted cotton.

Arizona. W. A. Stevenson (August 19): Recent examination of one field of short staple cotton near Tubac, Santa Cruz County, showed 5.2 percent of the bolls to be injured.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Georgia. L. W. Morgan (August 25): A few found in Echols County but no great amount of damage.

Florida. C. S. Rude and assistants (August 12): A few in many fields in Alachua, Marion, and Lake Counties, but they seemed to have been held in check by some factor. (August 26): Cotton in part of Gilchrist County stripped of tender parts. Moths migrating from these fields.

Mississippi. C. Lyle (August 24): The first larvae found in Mississippi were July 29 in George County; later found in Jackson County. On August 14 reported from Washington County and on the same date found generally distributed in Tate County. Larvae found at State College on August 17. Recent investigations in George County showed that parasites had prevented much of the expected damage.

Louisiana. C. O. Eddy (August 23): Abundant in local areas in northern Louisiana.

R. C. Gaines and assistants (August 26): So far as is known no control is necessary in Madison Parish. In Richland Parish considerable ragging of cotton reported, necessitating treatment.

Texas. F. L. Thomas (August 9): Less damaging than in the last several years. Larvae have appeared in Kaufman County, northern Texas, Runnels County, west-central Texas, and at Presidio, in the Big Bend, but no ragging caused except in a few locations. (August 16): Severe ragging in the coastal bend region, and control measures general in the upper coastal area, with some control being used as far north as McLennan County.



K. P. Ewing, et al. (August 26): Becoming more numerous in McLennan, Falls, and Limestone Counties, particularly in late-planted cotton. Injurious infestations in several fields. Considering the acreage of early planted cotton, there is comparatively small proportion of infestation in this area.

C. R. Parencia and S. E. Jones (August 19): Most of the cotton in Calhoun County defoliated, with the exception of a few fields that have been treated.

A. J. Chapman (August 19): Cotton in Presidio County not defoliated to any extent.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. F. L. Thomas (August 9): Infestation heavier and more generally distributed than last year in Cameron County, in the lower Rio Grande Valley.

R. E. McDonald (August 18): By the end of July considerable increase found in the infestation in the 1939 crop in Cameron County and in a comparatively small area in the southeastern part of Hidalgo County. Most heavily infested area is in the southern part of Cameron County next to the river, growing gradually lighter to the north, reaching the limits of the county and over a little into Hidalgo County both northward and westward. Incipient infestations found in the rest of Hidalgo, and in Willacy and Starr Counties.

A. J. Chapman (August 19): Green boll infestation counts made in 29 field in Presidio County during the first 15 days of August. Average infestation was 1.45 percent, with 1.82 larvae per infested boll and 4.24 bolls per plant. Last year for the same period the infestation in these fields averaged 43.41 percent, with 2.21 larvae per boll and 6.25 bolls per plant.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Oklahoma. C. F. Stiles (July 31): Reported in large numbers and as damaging cotton in Beckham County.

Texas. F. L. Thomas (August 9): Abundant and causing injury on young cotton in most areas of central and northern Texas. Counts in such fields range from 75 to 120 flea hoppers per 100 terminal buds. Little change during the last week in the infestations in Crosby, Dickens, and Lubbock Counties, northwestern Texas, which have from 15 to 34 flea hoppers per 100 terminals.

K. P. Ewing, et al. (August 5): In cotton planted about May 26 at Waco, 300 terminal buds inspected in the check plots of one of these experiments showed an average of 11.3 adults and 72.7 nymphs, or a total of 84 per 100 buds. In the experiment started this week 1,500 terminal buds showed an average of 13.9 adults and 89.2 nymphs, or a total of 103.1 per 100 buds. Average per field in the late-planted cotton was 12.6 adults and 81 nymphs,

or a total of 93.6 per 100 buds, a slight reduction from the infestation young cotton last week, the average then being 119.9 per 100 buds. (August 26): Below the damage point in practically all fields of late-planted cotton in McLennan, Falls, and Limestone Counties. Average infestation in the check plots of two experiments located in late-planted cotton was 11.3 and 18.3 flea hoppers per 100 buds, respectively. This a reduction from an average of 45.5 flea hoppers per 100 buds last week.

C. R. Parencia and S. E. Jones (August 19): Infestation not as high in Calhoun County as in the past.

#### APHIDS (Aphididae)

South Carolina. F. F. Bondy, et al. (August 26): Leaf aphids are fairly numerous on some treated fields in Florence County but not so numerous as in 1938.

Georgia. P. M. Gilmer, et al. (August 12): Increasing in treated fields of Sea Island in Tift, Cook, Berrien, Lowndes, and Echols Counties. No commercial damage. (August 19): Continuous, heavy rains have reduced infestations.

L. W. Morgan (August 25): A heavy infestation on all cotton that has shed its leaves in Lowndes and Echols Counties.

Florida. C. S. Rude and assistants (August 5): Leaves caused to fall in fields which have been treated consistently in Alachua, Gilchrist, Marion, Putnam, Union, and Lake Counties. A noticeable scarcity of ladybeetles in such fields. (August 26): Becoming less abundant.

Mississippi. C. Lyle (August 24): The cotton aphid (Aphis gossypii Glov.) is reported as numerous only in fields that have been treated for boll weevils.

R. L. McGarr, et al. (August 19): Still very numerous in a few of the experimental cuts in Oktibbaha County.

Louisiana. R. C. Gaines and assistants (August 26): Infestation has increased in most fields in Madison Parish that have been treated and in many fields that have not been treated. In some fields the shedding of the bottom leaves caused by aphids may prove to be beneficial instead of injurious, as it may prevent the destruction of the bottom bolls by boll rot.

#### A COTTON LEAF WORM (Prodenia litura F.)

Egypt. A. H. Rosenfeld (July 12): Egg masses continued to appear in all localities but in diminishing quantities, the infestation on the whole being lighter than last year, when it reduced the crop by about half a million bales. Hatching occurred in small areas that had escaped the collection of egg masses, particularly in the northern Delta, but only light damage was caused.



F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

GYPSY MOTH (Porthetria dispar L.)

Vermont. A. F. Burgess (August 5): Numerous adult males taken from tanglefoot surrounding cages put out in Vermont, New York, and Pennsylvania this season. It is evident from the moths taken at cages in Vermont that there has recently been considerable wind spread of young caterpillars from the heavily infested sections near the Connecticut River into the zone area just north of Rutland, in both Addison and Rutland Counties.

Pennsylvania. A. F. Burgess (August 12): Infestation was discovered in Spring Brook Township, Lackawanna County, a preliminary survey of which indicated the presence of some 46 egg clusters. Adult males continued to be recovered from tanglefoot at some of the cages in Pennsylvania.

F O R E S T   T E N T   C A T E R P I L L A R (Malacosoma disstria Hbn.)

Connecticut. P. Wallace (July 18): Only an occasional individual in Cornwall and Goshen. No damage noted this season.

New York. R. T. Webber (August 19): Abundant in several localities of Broome County. Many sugar maple and other deciduous trees had suffered heavy defoliation and had partly refoliated by August 18.

F A L L   W E B W O R M (Hyphantria cunea Drury)

Vermont. H. L. Bailey (August 25): Unusually abundant throughout the State.

Massachusetts. A. I. Bourne (August 22): Generally somewhat less abundant than usual; however, reports from the eastern part of the State indicate that it is slightly more abundant than in 1938, when it reached practically its lowest ebb in that section.

Connecticut. P. Wallace (July 18): Common everywhere but not causing much damage.

Rhode Island. A. E. Stene (August 24): In some instances appeared in large enough numbers almost to completely cover a tree with webs.

New York. R. E. Horsey (July 24): Noted on cotoneaster and tupelo in Rochester.

Maryland. E. N. Cory (August 17): Attacking fruit trees at Grantsville.

Virginia. H. G. Walker and L. D. Anderson (August 25): Rather abundant in eastern Virginia.



Georgia. T. Thompson (August 22): Observed during the latter half of August webbing persimmon and other trees along roadsides in Thomas County.

Florida. A. N. Tissot (August 24): Becoming fairly common in pecan groves, and individual trees rather severely injured.

Mississippi. C. Lyle (August 24): Very general infestation over the State, with a heavy infestation reported from the northeastern section.

Ohio. E. W. Mendenhall (August 19): In central Ohio it is a general feeder in considerable abundance on many trees.

G. A. Runner (August 17): Abundant throughout the lake counties on a good many of its usual host plants.

Indiana. L. F. Steiner (August 22): More abundant on shrubbery and on fruit and shade trees in and near Vincennes than at any time during the last 6 years.

HICKORY TUSsock MoTH (Halisidota caryae Harr.)

Connecticut. B. H. Walden (August): More abundant than usual on apple, elm, oak, and hickory.

Pennsylvania. L. E. Dills (August 23): Larvae feeding on walnut and linden on July 25. Uniformly distributed in northeastern and north-central parts of the State.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Washington. L. G. Smith (August 1): Larval specimens sent in with the report that they were causing considerable damage in San Juan County.

SCALLOP-SHELL MoTH (Calocalpe undulata L.)

Pennsylvania. L. E. Dills (August 23): Serious damage during July to foliage of wild cherry in many western counties.

A SPHINX MoTH (Pholus satellitia pandorus Hbn.)

Vermont. H. L. Bailey (August 25): Specimens of nearly full-grown larvae received since August 20 from several points in and about Montpelier.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Maryland. E. N. Cory (August 18): Rather abundant and attacking evergreens throughout Maryland.

District of Columbia. L. G. Baumhofer (August 16): During July and early in August many requests for information received from residents of Washington and vicinity, indicating an abundance of this insect this season.

Virginia. H. G. Walker and L. D. Anderson (August 25): Rather abundant on cedar, arborvitae, and other ornamental plants in eastern Virginia this year.

Alabama. J. M. Robinson (August 18): Reported on arborvitae at Brent and Jasper on July 20.

Mississippi. C. Lyle (August 24): Specimens received from Coahoma County on July 31. Reports of injury received from Covington County and from the central section of the State.

Ohio. J. N. Knull (August 15): Larvae doing some damage to arborvitae and juniper at Columbus.

Indiana. J. J. Davis (August 28): Frequently reported from the southern third of the State as feeding on cedar, arborvitae, pine, and spruce.

Kentucky. M. L. Didlake (August 25): Unusually abundant, mostly on evergreens, in localities scattered throughout the State.

Michigan. R. Hutson (August 22): Reported at Lake City and Detroit on arborvitae.

Oklahoma. F. A. Fenton (August 19): Found on evergreen at Oilton, Creek County.

Texas. R. K. Fletcher (August 12): Reported from Bell, Harris, and Erath Counties, east-central Texas.

#### OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

New York. R. E. Horsey (August 19): Several small ash trees at Rochester found badly incrustated. Fairly common.

#### ASH

##### AN ASH FLOWER GALL (Eriophyes fraxiniflora Felt)

New York. R. E. Horsey (August): On July 29 very numerous on a white ash in Rochester. The galls formed this year are rather ornamental, being green like the leaves. The blackened galls from last year, some of which are still on the tree, are unsightly.

Utah. G. F. Knowlton (July 10): Ash infested with this mite at Logan. (Det. by H. H. Keifer.)

#### BEECH

##### A BRANCH PRUNER (Xylotrechus quadrimaculatus Hald.)

Massachusetts. E. P. Felt (August 21): Found somewhat abundantly in beech at Chatham.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

New York. R. E. Horsey (August 18): A number of European white birches, 25 to 30 feet in height, are dying or dead at Rochester and Irondequoit. This insect killed about all the European birches in this vicinity years ago, and the trees planted in recent years are now dying.

Ohio. E. W. Mendenhall (August 19): Injurious on white birch in Columbus and throughout southwestern Ohio. Also injurious in Delaware and vicinity, central Ohio.

Indiana. J. J. Davis (August 28): Reported as destructive more frequently than for the last 20 years, chiefly from central and northern Indiana.

BOXELDER

BOXELDER BUG (Leptocoris trivittatus Say)

Michigan. R. Hutson (August 22): First specimens for the season arrived today from Garden City.

North Dakota. J. A. Munro (August 22): Moderately abundant at Fargo.

Montana. D. J. Plotsch (August 5): On and near a boxelder tree on the experiment station grounds at Huntley. A few specimens causing annoyance.

Idaho. F. H. Shirck (August 21): Reported as very troublesome, invading a house in the vicinity of Parma. Relief obtained by control measures.

Utah. G. F. Knowlton (August 12): Annoying in houses at Salt Lake City and Bountiful.

CATALPA

CATALPA SPHINX (Ceratomia catalpae Bdv.)

Ohio. J. N. Knull (August 15): Many catalpas in Columbus being defoliated.

Indiana. J. J. Davis (August 28): Abundant and defoliating many catalpa groves in the northern half of the State.

Kentucky. M. L. Didlake (August 25): Defoliating trees at Lexington.

Mississippi. C. Lyle (August 24): Reported as defoliating catalpa trees in Grenada County.



COMSTOCK'S MEALYBUG (Pseudococcus comstocki Kuw.)

Ohio. E. W. Mendenhall (August 4): Some damage to catalpa leaves in a street planting in Columbus. (Det. by J. S. Houser.)

CHESTNUT

A CHESTNUT APHID (Calaphis castaneae Fitch)

New Jersey. M. D. Leonard (August 10): A number of head-high chestnut seedlings examined at Ridgewood, and 2 or 3 alates and about 6 apterae found on the undersides of leaves.

CYPRESS

A CYPRESS MOTH (Argyresthia cupressella Wlsm.)

Washington. M. J. Forsell (June 30): Cypress moths from the Montlake district of Seattle, where this pest is very destructive. (Det. by A. Busck.)

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Massachusetts. A. I. Bourne (August 22): Very severe damage caused in towns in eastern part of the State, especially in Norfolk, Bristol, and Plymouth Counties.

C. N. Smith (July 28): Extensive destruction of foliage of elm shade trees at Vineyard Haven, on Martha's Vineyard.

Connecticut. P. Wallace (July 18): Complete skeletonization of leaves of a few elms in various towns. Nowhere serious except on a few individual trees. Noted in Derby, Shelton, Branford, Ansonia, Woodbury, Cornwall, and Seymour.

New York. C. W. Collins and E. T. Webber (August 19): Noted to be causing severe injury to elm foliage in some localities of Rockland, Orange, and Dutchess Counties, eastern New York.

Pennsylvania. L. E. Dills (August 23): Increased in the northeastern counties this year, and second-brood adults observed during July.

Virginia. A. M. Woodside (August 21): Common in Augusta County and has caused considerable damage to elms.

Ohio. J. S. Houser (July 31): Recently found at Bluffton, 60 miles from the northern boundary of the State. This is the farthest north the insect has been discovered.

E. W. Mendenhall (August 14): Abundant on Chinese elms in nurseries at Columbus. English elms also badly infested. Second brood now appearing but not as bad as the first.

Utah. G. F. Knowlton (July 31): Seriously damaging elms at Smithfield, 13 trees on 1 property being largely skeletonized and every leaf examined conspicuously injured.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Indiana. J. J. Davis (August 28): Reported as abundant on elm, especially in the central and northern parts of the State.

Utah. G. F. Knowlton (July 31): Damaging many elms at Logan, Ogden, and Salt Lake City.

FIR

A TORTRICID (Epinotia meritana Heinr.)

Utah. J. A. Beal (August 18): Defoliation of Abies concolor in Bryce Canyon National Park much more severe than in previous years. (Det. by D. DeLeon.)

HICKORY

HICKORY LEAF STEM GALL (Phylloxera caryaecaulis Fitch)

New Jersey. E. P. Felt (August 21): Extremely abundant on hickories at Short Hills.

LARCH

LARCH SAWFLY (Lygaeonematus erichsonii Htg.)

West Virginia. B. H. Wilford (August 12): Reported as causing much defoliation of larch on a plantation on the Monongahela National Forest. This insect was first noticed on larch once in 1937. In 1938 it caused only a little defoliation. (Det. by R. A. Cushman.)

LINDEN

LINDEN WART GALL (Cecidomyia verrucicola O. S.)

New York. E. P. Felt (August 21): Extremely abundant on linden leaves in the vicinity of Albany.

AN APHID (Myzocallis tiliae L.)

New Jersey. M. D. Leonard (August 10): A number of large city basswood trees at Ridgewood have been previously reported as infested with this aphid. Today found to be very lightly infested, an occasional leaf having 1 or 2 aphids or so on the underside. Several alates seen.

## LOCUST

### LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Massachusetts. A. I. Bourne (August 22): Locusts in southeastern Massachusetts, particularly Plymouth County, showed heavy attack.

Pennsylvania. E. P. Felt (August 21): Reported in injurious numbers from the Philadelphia area.

L. E. Dills (August 23): Serious damage in the southwestern counties.

Virginia. A. M. Woodside (August 21): , Severe and extensive damage to foliage of black locust in Augusta and Rockingham Counties.

Mississippi. C. Lyle (August 24): Locust trees in the northeastern section turned brown by this insect. Injury apparently worse in Union and Pontotoc Counties.

## MAPLE

### GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Vermont. H. L. Bailey (August 4): An outbreak at Lyndon, Caledonia County, northeastern Vermont. Red maples stripped and some sugar maples more lightly attacked. Some larvae nearly full grown.

Massachusetts. A. F. Burgess (August 21): According to field observations, this pest is quite abundant throughout Berkshire County.

Michigan. E. I. McDaniel (August 24): Specimens received from Manistique, where they were defoliating large areas of maple forest. Many larvae had pupated.

Minnesota. R. H. Nagel (August 17): Complete defoliation of sugar maple observed on both sides of the highway for about a mile near Tower, Saint Louis County. Mountain maple in the area apparently untouched. Larvae mostly mature.

### NORWAY MAPLE APHID (Periphyllus lyropictus Kess.)

New Jersey. M. D. Leonard (August 24): Several maple trees under periodic observation at Ridgewood and not infested for some weeks, now have small colonies developing on the undersides of many leaves.

### COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Minnesota. H. Milliron (August 18): Abundant on maple and boxelder at Detroit Lakes and Sauk Center.



MOUNTAIN ASH

A SAWFLY (Pristiphora geniculata Htg.)

New Hampshire. T. Parr (August 10): Since August 1 several infestations have been observed, stripping mountain ash on Mt. Osceola, Mt. Passaconaway, and Mt. Whiteface.

OAK

A BUDWORM (Cacoecia fervidana Clem.)

Wisconsin. E. L. Chambers (July 31): Specimens received which had been working on oak in northern Wisconsin and proving to be a very serious pest. (Det. by A. Busck.)

A LACEBUG (Corythucha arcuata Say)

Maryland. E. N. Cory (August 9): Attacking oak at Trappe.

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

New York. E. P. Felt (August 21): Present in small numbers on pin oak at Westbury.

Alabama. J. M. Robinson (August 18): Reported on oaks at Piedmont on July 21

PINE

WHITE PINE WEEVIL (Pissodes strobi Peck)

Michigan. R. Hutson (August 22): Specimen submitted from Ann Arbor.

Minnesota. H. Milliron (August 18): Very abundant at Saint Cloud in spruce seedlings.

BARK BEETLES (Scolytidae)

Rhode Island. A. E. Stene (August 24): Ips calligraphus Germ. on white pine reported in a number of places, apparently the aftermath of the hurricane.

North Carolina. C. S. Brimley (August 7): Bark beetles (I. calligraphus and Dendroctonus terebans Oliv.) observed since August 2 as severely injuring a pine grove at Reidsville.

B. H. Wilford (August 12): An outbreak of the southern pine beetle (D. frontalis Zimm.) on the Pisgah National Forest near Hot Spring has destroyed about 10 acres of shortleaf pine.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Pennsylvania. E. P. Felt (August 21): Injury found to be somewhat common in pine tips in the Philadelphia area.

Maryland. E. N. Cory (July 24): Attacking pine at Woodlawn.

Mississippi. C. Lyle (August 24): Pine twigs containing larvae sent from Attala County on August 22.

Missouri. J. A. Denning (August 7): Specimens infesting pine received from Jefferson City. (Det. by C. Heinrich as Rhyacionia sp. presumably frustrana.)

A TIP MOTH (Eucosoma gloriola Heinr.)

Massachusetts. E. P. Felt (August 21): Injury to white pine by this comparatively recent new pest was received from Stockbridge.

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Colorado. D. DeLeon (August 18): Attacking ponderosa pine in the Sugarloaf area but seems to have declined in numbers. Has appeared for the first time in numbers in the northern Saint Vrain Canyon, near Estes Park. Defoliation of Douglas-fir more widespread than last year in Douglas-fir stands on the east side, and in many localities so heavy that death of trees may result.

A SPHINX MOTH (Lapara bombycoides Walk.)

Connecticut. G. H. Plumb (August 23): Ten larvae in different stages of development taken in a small planting of red pine at North Haven. Not enough larvae present to cause damage.

RED-HEADED PINE SAWFLY (Neodiprion lecontei Fitch)

Michigan. R. Hutson (August 22): Specimens submitted from Bitolev and Boyne City.

Alabama. B. H. Wilford (August 12): A heavy infestation reported on loblolly and shortleaf pines in plantations in northwestern Alabama. (Det. by R. A. Cushman.)

Mississippi. C. Lyle (August 24): Larvae received from Hinds County on August 7, where they were feeding on Cedrus deodara.

INTRODUCED PINE SAWFLY (Diprion simile Htg.)

Connecticut. J. V. Schaffner, Jr. (August 23): Four heavy infestations observed on ornamental jack, Scotch, and white pine trees in residential areas in Hamden and New Haven. In each case only 1 or 2 trees severely infested, and the infestations were from 1 to 5 miles apart.

PINE BARK APHID (Pineus strobi Htg.)

Pennsylvania. L. E. Dills (August 23): Isolated infestations in Monroe County on July 18.

Minnesota. H. Milliron (August 12): Moderately abundant on white pine at Rice.

A SCALE (Toumeyella parvicorne Oкл1.)

South Carolina. J. A. Berly (July 22): Scale insects, collected on long leaf pine, received from Camden. (Det. by H. Morrison.)

POPLAR

COTTONWOOD LEAF BEETLE (Chrysomela scripta F.)

Minnesota. H. Milliron (August 18): Abundant at Alexandria on cottonwood.

POPLAR VAGABOND APHID (Mordwilkoja vagabunda Walsh)

G. F. Knowlton (August 14): A few small trees at Myton severely infested.

SPRUCE

EASTERN SPRUCE GALL APHID (Adelges abietis L.)

Maryland. E. N. Cory (August 1): Found at Selbysport.

SITKA SPRUCE GALL APHID (Adelges cooleyi Gill.)

New Hampshire. E. P. Felt (August 21): Reported from Madison.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

Pennsylvania. L. E. Dills (August 23): Abundant throughout the summer in northeastern and north-central counties.

SYCAMORE

A TUSsock MoTH (Halisidota harrisi Walsh)

New Jersey. F. A. Soraci (August 18): As much as 30-percent defoliation on Platanus orientalis at Grantwood and vicinity. Larvae are full or nearly full grown. Parasitized larvae common.

WILLOW

POPLAR AND WILLOW BORER (Sternochetus lapathi L.)

Oregon. W. D. Edwards (August 21): Adults laying eggs in bark of willows, poplars, and birches at Portland and vicinity.

AN APHID (Chaitophorus viminalis Monell)

New Jersey. M. D. Leonard (August 10): Water sprouts on a willow tree at Ridgewood reported as badly infested during July but only lightly infested when examined on August 3 and 10. Dry weather and lady beetles and their larvae seem to be the causes of decrease.



INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

A TUSSOCK MOTH (Hemerocampa definita Pack.)

Massachusetts. E. P. Felt (August 21): The yellow-headed tussock caterpillar was reported as injuring hydrangeas, vines, and other leaves at Lenox.

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

Nebraska. M. H. Swenk (August 15): Larvae were found on July 17 to be feeding on the leaves of woodbine in Webster County.

A BILLBUG (Calendra tarda Fall)

California. R. Cecil (August 17): Larvae feeding on grass roots killing the Kentucky bluegrass at Ventura. In lawns of mixed grass only the Kentucky bluegrass is killed. This is the first year we have noticed this insect in this vicinity. (Det. by L. L. Buchanan.)

HAIRY CHINCH BUG (Blissus hirtus Montd.)

New York. N. Y. State Coll. Agr. News Letter (August 7): Many of the lawns in Suffolk County, eastern New York, are infested. (August 21): An average of 5 to 10 calls a day in Westchester County on these bugs, which are causing considerable damage, especially during the dry period.

Florida. A. N. Tissot (August 24): The chinch bug (B. insularis Barber) was damaging a lawn in Saint Petersburg on August 12.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Mississippi. C. Lyle (August 24): Reported as rather numerous in the southern part of the State. In at least one place the adults were causing trouble in restaurants. Specimens received from Madison and Pike Counties on crapemyrtle, gardenia, and privet.

MEALY FLATA (Ormenis pruinosa Say)

Oklahoma. F. A. Fenton (August 19): Found on plants at Oklahoma City in the central part of the State.

GOLDENGLOW APHID (Macrosiphum rudbeckiae Fitch)

Utah. G. F. Knowlton (August 18): The cone flower aphid is injuring goldenrod and chrysanthemums at Kaysville and hollyhock and asters at Logan.

AN APHID (Capitophorus gillettei Theob.)

New York. M. D. Leonard (August 21): For several weeks Polygonum pennsylvanicum plants in pots at Flushing were thoroughly infested. The undersides of the leaves developed almost a solid crust of aphids. More recently the infestation has become very light.

MEALYBUGS (Pseudococcus spp.)

Virginia. H. G. Walker and L. D. Anderson (August 25): Attacking gardenia, euonymus, and other ornamental plants at Norfolk, Portsmouth, and Virginia Beach.

Ohio. E. W. Mendenhall (August 4): P. comstocki Kuw. doing considerable damage to outdoor petunia plants in some places in Columbus. (Det. by J. S. Houser.)

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

New Jersey. E. P. Felt (August 21): Extremely abundant on lilac stems at Short Hills.

Maryland. E. N. Cory (July 20): Attacking Japanese cherries at Mount Rainier.

Virginia. H. G. Walker and L. D. Anderson (August 25): Several requests for control on many ornamental plants, but this insect does not appear to be as injurious this year as last.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Virginia. R. I. Bosman (July 31): On boxwood, ivy, and other shrubs from Norfolk. (Det. by Louise M. Russell.)

Mississippi. C. Lyle (August 24): Specimens received from Hancock and Jones Counties on July 28 and August 4, respectively.

SOFT SCALE (Coccus hesperidum L.)

Minnesota. H. Milliron (August 18): Abundant on English ivy at Saint Paul.

CYCLAMEN MITE (Tarsonemus pallidus Banks)

Virginia. H. G. Walker and L. D. Anderson (August 25): A greenhouse grower at Norfolk has been having considerable trouble with these mites on snapdragons.

BUCKTHORN

PUTNAM'S SCALE (Aspidiotus ancylus Putn.)

Minnesota. H. Milliron (August 18): Abundant on Rahmnus sp. at Saint Paul.

CANNA

LARGER CANNA LEAF ROLLER (Calpodes ethlius Cram.)

Georgia. T. L. Bissell (August 11): Full-grown larvae badly ragged a clump of canna at Griffin, central Georgia, on July 24. On August 6 very small larvae were just starting on plants.

COLUMBINE

COLUMBINE BORER (Papaipema purpurifascia G. & R.)

Connecticut. Beatrice M. Hinkle (August 8): Borers infesting roots on crowns of columbine plant at Washington on August 2.

COLUMBINE LEAF MINER (Phytomyza minuscula Gour.)

New Jersey. M. D. Leonard (August 10): Abundant and apparently fresh mines continuing almost to fill newer leaves as they open up. Observations made on a number of plants kept under observation at Ridgewood.

AN APHID (Pergandeidia trirhoda Walk.)

New Jersey. M. D. Leonard (August 10): This columbine aphid very scarce on a number of plants kept periodically under observation at Ridgewood.

DAHLIA

SUNFLOWER WEEVIL (Rhodoaenus tredecimpunctatus Ill.)

Georgia. T. L. Bissell (August 19): Two reports of injury to dahlia at Experiment, central Georgia, have been received. In one instance both leaf bases and the main stem were mined.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Maryland. E. N. Cory (July 20): Attacking euonymus at Cumberland.

Virginia. H. G. Walker and L. D. Anderson (August 25): Rather abundant on many euonymus plantings at Norfolk.

Mississippi. C. Lyle (August 24): Reported as abundant in the central and northeastern sections and the Meridian district. Specimens received on July 20 from Monroe County.

FERN

FERN SCALE (Pinnaspis aspidistrae Sign.)

Alabama. J. M. Robinson (August 18): Reported on ferns at Cullman on July 24.



GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Rhode Island. A. E. Stene (August 24): Appear to be more abundant than for 2 or 3 years past.

Minnesota. H. Milliron (August 18): Abundant on gladiolus at Alexandria.

HAWTHORN

AN APHID (Eriosoma crataegi Oestlund)

New York. M. D. Leonard (August 21): This woolly hawthorn aphid quite abundant on twigs of several trees in Flushing. First observed the last of July and still present.

IRIS

IRIS BORER (Macronoctua onusta Grote)

Michigan. E. I. McDaniel (August 24): Specimens of pupae received today from Pontiac, where they had caused considerable damage and loss on one of the large plantings.

JUNIPER AND CEDAR

CEDAR BARK BEETLE (Phloeosinus dentatus Say)

Nebraska. M. H. Swenk (August 15): Report from Seward County on July 29 that cedar trees were being attacked by this engraver beetle.

JUNIPER WEBWORM (Dichomeris marginellus F.)

Ohio. E. W. Mendenhall (August 19): Quite bad in Irish juniper stock in nurseries in Franklin County.

JUNIPER SCALE (Diaspis carueli Targ.)

New York. R. E. Horsey (August 25): Numerous on Pfitzer juniper in a yard at Rochester.

Michigan. R. Huston (August 22): Observed at Big Rapids.

LAUREL

AN APHID (Thoracaphis umbellulariae Essig)

California. E. O. Essig (August 19): This aphid gradually spreading onto the native California laurel at Bolinas, near San Francisco Bay. First noted at Berkeley in 1929.

LILAC

LILAC BORER (Podosesia syringae Harr.)

Oklahoma. F. A. Fenton (August 19): Found on lilac bushes at Ponca City, Kay County.

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (August 15): Young scales are moving and very numerous on magnolia at Rochester.

PYRACANTHA

LEAF CRUMPLER (Mineola indigenella Zell.)

Texas. R. K. Fletcher (August 12): Sent in from Tarrant County, collected from the ornamental pyracantha. This is the first time it has been reported to this office from northern Texas.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

Connecticut. E. P. Felt (August 21): The second brood was somewhat abundant at Stamford.

ROSE

MOSSY ROSE GALL (Rhodites rosae L.)

Minnesota. H. Milliron (August 18): Abundant on rose at Fergus Falls.

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (August 10): Very scarce and only on occasional tender shoots on many rose bushes examined at Ridgewood.

SNOWBALL

A MITE (Epitrimerus sp.)

Iowa. G. R. Titus (August 1): Microscopic plant mite on surface of leaves of Viburnum lentago, collected at Des Moines. None of the V. prunifolium growing against the V. lentago affected. (Det. by H. H. Keifer.)

WATERLILIES

A PYRALID BORER (Nymphula gyralis Hulst)

Georgia. C. H. Alden (July 22): Borers breeding in waterlilies received from Clarkeston. (Det. by C. Heinrich.)

# INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

## MAN

### MOSQUITOES (*Culicinae*)

North Carolina. C. S. Brimley (August 11) The yellow-fever mosquito (*Aedes aegypti* L.) biting people and causing much annoyance in day-time at Raleigh.

Florida. F. C. Bishopp (August 10): Southern salt-marsh mosquito (*A. taeniorhynchus* Wied.) present in very annoying numbers at Fort Pierce. Some present in well-screened public buildings. These mosquitoes believed to be a persistent residue from the original July brood, as recent conditions have not been favorable for the development of additional broods.

W. V. King (July 31): Reports and light-trap collections have indicated that very severe outbreaks of mosquitoes have occurred during June and July in nearly all of the east-coast counties and in most of the southern area of the west coast of Florida. Numbers obtained from traps in Pinellas, Hillsborough, Saint Lucie, and Palm Beach Counties apparently much larger than those obtained at any time during the last 5 years. Salt-marsh mosquitoes (*A. sollicitans* Walk.) continuously troublesome in Volusia County during July but a gradual decrease was indicated the last week of the month.

J. B. Hull (July 1): Just after July 1, the Saint Lucie section experienced the heaviest flight of salt-marsh mosquitoes that has occurred in several years. The flight was not confined to salt-marsh brooders, however, as fresh-water species were also numerous, especially *Escherichia solitaria* D. & K.

Oregon. H. R. Stage (July 31): Isolated outbreaks of *Culex pipiens* L. and *C. tarsalis* Coq. reported from Portland and Lebanon, respectively.

Utah. G. F. Knowlton (August 17): Mosquitoes, *Aedes* sp., abundant and very annoying to man and livestock in fields at Appledale, Corrino, Tuah Public Shooting Grounds, and Penrose, in Box Elder County.

### EYE GNATS (*Hippelates* spp.)

Georgia. T. Thompson (August 22): Very annoying to workers outdoors in Pierce, Lowndes, Brooks, and Thomas Counties, southern Georgia, throughout August.

### AMERICAN DOG TICK (*Dermacentor variabilis* Say)

Massachusetts. C. N. Smith (July 31): Adults declined rapidly in numbers at Vineyard Haven, on Martha's Vineyard Island, throughout July, so that by the end of the month they were scarce in most areas. The



immature stages remained active and populations on meadow mice built up rapidly.

South Carolina. F. C. Bishopp (August 11): Very few adults found to be active on Bull Island.

Kentucky. M. L. Didlake (August 25): Tick reported at Frankfort.

ROCKY MOUNTAIN SPOTTED FEVER TICK (Dermacentor andersoni Stiles)

Utah. G. F. Knowlton (August 15): Several cases of Rocky Mountain spotted fever and tularemia have been reported from Carbon County, one case resulting in death.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Kentucky. M. L. Didlake (August 25): Two complaints from Lexington and suburbs.

Kansas. K. R. Lundeberry (August 10): Specimens submitted from Fort Leavenworth. Ticks found in a house and occur by hundreds under floor boards and in cracks behind doors. (Det. by H. E. Ewing.)

CATTLE

SCREWORM (Cochliomyia americana C. & F.)

Georgia. T. Thompson (August 22): Farmers report severe infestations in Pierce, Lowndes, Brooks, and Thomas Counties, southern Georgia, in latter half of August.

A. L. Brody (July 31): Numerous infestations of animals at the experimental farm at Valdosta. High incidence in these animals reflects conditions throughout southern Georgia. Exceptionally high numbers of screwworm reported.

E. E. Rogers (August 26): Highest numbers of adults caught in status trap at Valdosta since August 1. Report of infestations on a pig from near Clyattville.

Florida. F. C. Bishopp and A. L. Brody (August 4): Along the western coast, from Carrabelle to Pensacola, and inland at Milton, Chipley, Crestview and Youngstown more cases of screwworm attack on livestock are reported than have occurred since 1935. Cases not numerous except in a few herds that were exceptionally inviting to screwworm attack because of injuries or operations.

A. L. Brody (August 28): Stockmen in Levy County report serious trouble from screwworms, statements regarding percentage of infestation varying greatly--from 4 to 90 percent. The Gulf coast tick reported as an important predisposing cause.

Alabama. J. M. Robinson (August 18): Reported at Selma and Geneva.

Texas. R. Melvin (July 31): Population of screwworm, as indicated by the number of infested animals, was low in the Menard area during the month.

D. C. Parman (July 31): Collections from traps at Uvalde indicate that there was approximately a 10- to 15-fold increase in the total blowfly population during July. Practically all the increase has been in C. macellaria F. Apparently only a slight increase of C. americana during the latter part of the month. An apparent decrease in the numbers of this species was indicated during the month in the area about Del Rio.

STABLEFLY (Stomoxys calcitrans L.)

Florida. F. C. Bishop and A. L. Brody (August 4): Very scarce along the coast of western Florida from Carrabelle to Pensacola. Not more than one or two seen on an animal and few present in barns. A few more observed at inland points, such as Milton, Chipley, and Youngstown. A mild outbreak reported by several farmers as occurring early in July.

A. L. Brody (August 19): Larvae found breeding in windrows composed of sea weeds (Thalassia spp.) and other plants on the shore of the bay within the limits of Panama City.

HORN FLY (Haematobia irritans L.)

Florida. F. C. Bishopp and A. L. Brody (August 4): Very scarce along the coast of western Florida, from Carrabelle to Pensacola. Many herds observed had practically none, and the heaviest infestation seen was about 25 flies per animal. Horse guards (Bombus sp.) are numerous around livestock.

Texas. W. G. Bruce (July 31): Horn flies not troublesome in the vicinity of Dallas during July, but at Cresson infestations in uncontrolled pastures observed in excess of 3,500 flies per head.

LONE STAR TICK (Amblyomma americanum L.)

South Carolina. F. C. Bishopp (August 11): Found present in considerable numbers in all stages in most areas on Bull Island. Seed ticks and nymphs extremely abundant and annoying to people.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. E. B. Blakeslee (August 26): Males and females still abundant at Valdosta.

HORSE

HORSEFLIES (Tabanidae)

Florida. F. C. Bishopp and A. L. Brody (August 4): Horseflies, of several species observed as annoying livestock to some extent along the western coast, from Carrabelle to Pensacola, and also inland near the Escambia

River. The largest number seen per animal was about five.

### RABBIT

A FLESH FLY (Wohlfahrtia vigil Walk.)

Pennsylvania. L. H. Bennett (August 8): From 3 to 5 percent of nestling cottontail rabbits in Center County infested with larvae.

## HOUSEHOLD AND STORED-PRODUCTS INSECTS

### TERMITES (Isoptera)

Pennsylvania. C. C. Zeliff (August 7): Reticulitermes flavipes Kol. found in a window seat in a house in Altoona.

Oklahoma. F. A. Fenton (August 19): Termites found on trees at Dover, Kingfisher County, and on cherry trees at Guthrie, Logan County.

### ANTS (Formicidae)

Connecticut. N. Turner (August 22): An unusually large number of cases of Camponotus herculeanus pennsylvanicus Deg. in buildings reported.

Delaware. D. MacCreary (August 14): Specimens of Solenopsis molesta Say sent in were part of a large flight which occurred recently in various parts of the State. Collected at Newark on August 8. (Det. by M. R. Smith.)

Florida. A. N. Tissot (August 24): Small red ants, species undetermined, but possibly Wasmannia auropunctata Roger from nesting habit. Reported as very troublesome in a house and citrus grove at Naples on August 8.

Mississippi. C. Lyle (August 24): Specimens of the Argentine ant (Iridomyrmex humilis Mayr) received from Lowndes County on August 18, where there is a reinfestation in Columbus. Other places have recently complained of them. Specimens of Pharaoh's ant (Monomorium pharaonis L.) received from Clarke County on August 7 and from Sunflower County on August 11. Specimens of S. molesta received from Yazoo County on July 20. The fire ant (S. xyloni McCook) very numerous this summer. Specimens received from Leflore and Yazoo Counties, and reports received from Lee and Washington Counties, as well as from the southeastern section. Specimens of carpenter ants, Camponotus herculeanus pennsylvanicus, received from Adams County, where they were nesting beneath the floor of a house.

Oklahoma. F. A. Fenton (August 19): Black ants found in house at Ponca City, Kay County, and on cherry trees at Hinton, Caddo County; house ants found in house at Roff, Pontotoc County, and in house and lawn at Purcell, McClain County; and ants found in lawn at Norman, Cleveland County.



Arizona. C. D. Lebert (August 18): Specimens of ants, Pogonomyrmex barbatus var. near molefaciens Buckley, sent in from Phoenix on August 8 from house. Winged forms of ants came into a house by the millions, following heavy rains. Swarms continuing for 5 nights. Roof of house completely covered with ants. Other ants of this species taken from a hill near the house.

Texas. R. K. Fletcher (August 12): House ants of undetermined species reported from Brazos, Gray, and Bexas Counties. House ants reported very frequently all summer.

#### HOUSE CRICKET (Gryllus domesticus L.)

New Jersey. C. W. Collins and C. L. Griswold (August 19): Observed breeding abundantly in an area in Denville Township, Morris County. These insects spread to a nearby store, tavern, and residences in annoying numbers and after fire was started in the dump they migrated in large numbers to nearby buildings.

Maryland. E. N. Cory (August 18): Particularly heavy infestation in houses at Colmar Manor.

#### GERMAN COCKROACH (Blattella germanica L.)

Minnesota. H. Milliron (August 18): Abundant in houses in Litchfield and Lucan.

#### AUSTRALIAN COCKROACH (Periplaneta australasiae F.)

Utah. G. F. Knowlton (August 21): Infesting one food storhouse at Farmington.

#### BROWN-BANDED COCKROACH (Supella supellectilium Serv.)

Florida. A. N. Tissot (August 24): Sent in from Saint Petersburg on August 14. Reported as rather numerous in a house.

#### CARPET BEETLES (Dermestidae)

Minnesota. H. Milliron (August 18): Attagenus piceus Oliv. moderately abundant on household goods at Saint Paul and Minneapolis.

Nebraska. M. H. Swenk (August 15): Specimen received on July 21 of the black carpet beetle (A. piceus) taken from under a rug. Specimen of varied carpet beetle (Anthrenus verbasci L.), sent in on July 19, found infesting a house in Douglas County.

Utah. G. F. Knowlton (August 14): Anthrenus scrophulariae L. damaging overstuffed furniture in a house at Logan.

CADELLE (Tenebroides mauritanicus L.)

Minnesota. H. Milliron (August 18): Abundant at New Richmond in flour.

Michigan. R. Hutson (August 22): Observed in grain bins at Lansing, Mulliken, and Allegan.

Nebraska. M. H. Swenk (August 15): A granary in Boone County reported infested with the cadelle on August 9.

A BOSTRICID BORER (Dinoderus brevis Horn)

Minnesota. H. Milliron (August 18): Abundant on imported bamboo at Anoka.

POWDER POST BEETLES (Lyctus spp.)

Ohio. G. R. Powers, Jr. (August 22): Specimens sent in of L. parallelopipedus Melsh. and L. planicollis Lec. were discovered in lumber stored in warehouse at Columbus. (Det. by W. S. Fisher.)

CAMEL CRICKETS (Ceuthophilus spp.)

Nebraska. M. H. Swenk (August 15): Have been very abundant for this type of insect during the period July 16 to August 15.

M I S C E L L A N E O U S   N O T E S

Washington. M. H. Hatch (August 8): Two specimens of a tenebrionid, Cynaesus angustatus Lec., collected from a flour mill, were sent in for identification. (Det. by E. A. Chapin.)

L. G. Smith (August 16): A number of ephydrid flies (Ephydra subopaca Loew) sent in from Grant County with report that millions of them were present in and on top of the mud on shores of Soap Lake.





THE INSECT PEST SURVEY  
BULLETIN

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Volume 19

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September 15, 1939

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BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING



# INSECT PEST SURVEY BULLETIN

Vol. 19

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## HESSIAN FLY SURVEY AT HARVEST TIME 1939

Summarized by W. B. Cartwright  
U. S. Bureau of Entomology & Plant Quarantine  
Division of Cereal and Forage Insect Investigations

Field surveys made by the Bureau of Entomology and Plant Quarantine at Manhattan, Kans.; Lafayette, Ind.; and Carlisle, Pa., and by the State agricultural experiment stations of Illinois and Ohio indicate that hessian fly infestations are low in wheatfields throughout Maryland, Delaware, Virginia, north-central North Carolina, Tennessee, southern Illinois, and central and western Kansas. There are, however, menacing populations of flies in local fields and areas in most of these States or districts.

Hessian fly infestations range from low to moderate in eastern and south-central Pennsylvania, Kentucky, southern Indiana, southern Michigan, southwestern Missouri, and eastern Kansas, with local infestations trending upward. No surveys were reported for the remainder of Missouri or for Iowa or Nebraska, but fragmentary data indicate that infestations are from low to moderate in central and northern Missouri, southeastern Nebraska, and southern Iowa. Observance of the safe-seeding dates is advised in all areas of low-to-moderate infestation, because the season has been favorable for hessian fly and for growths of volunteer wheat in many areas.

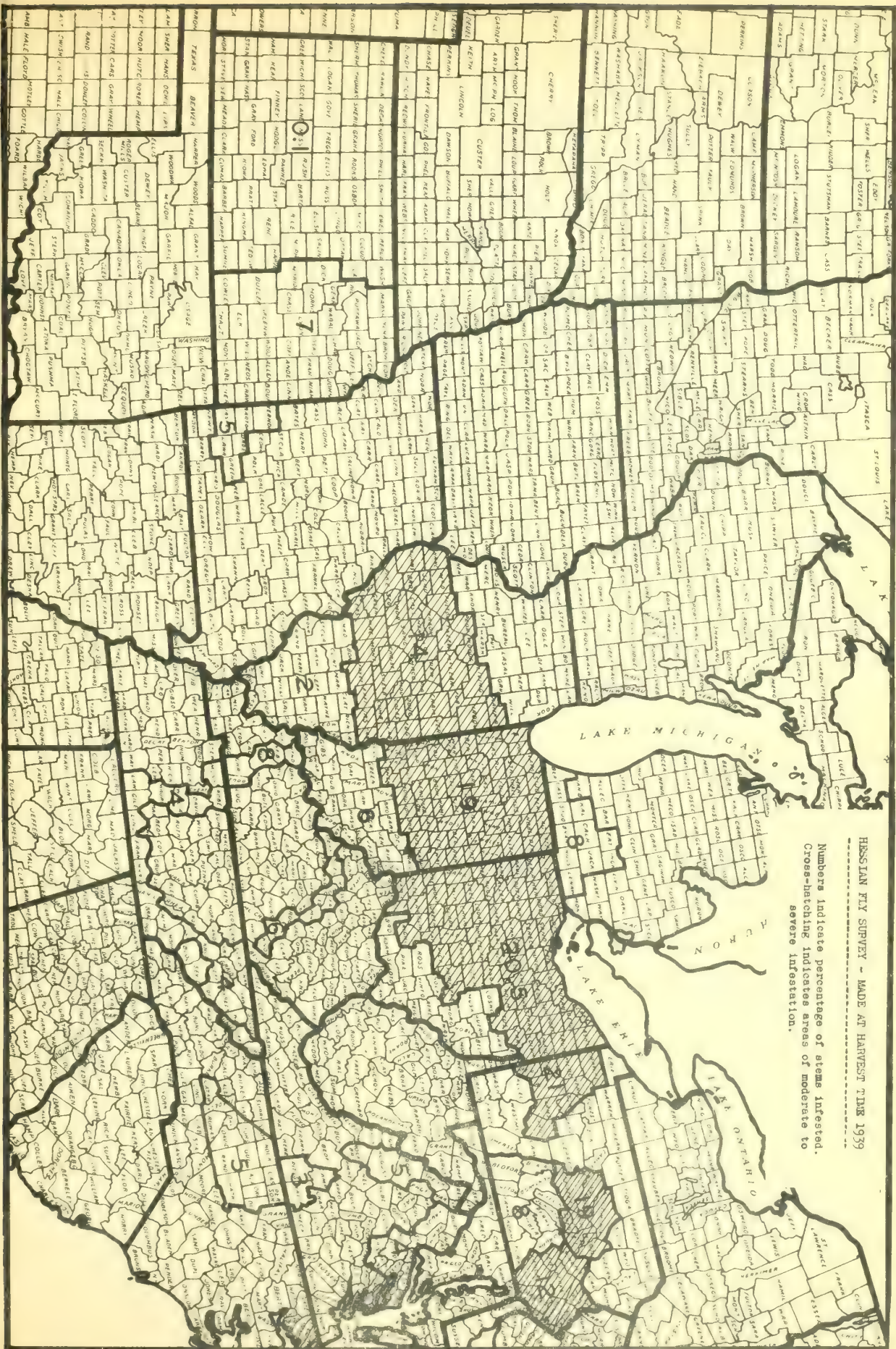
From moderate-to-heavy infestations of the hessian fly occur in north-central and western Pennsylvania, north-central Ohio, the northern two-thirds of Indiana, and central Illinois. In these areas the fly is menacing and the seeding of wheat should be delayed until the safe-seeding date or from 1 to 3 days after that date, in order to lessen the chances of heavy infestation of hessian fly.

The summarized data below and the accompanying map indicate more fully the regions covered by the survey and the general trend of fly infestations. A field sample in the survey usually consisted of 50 wheat stems.



Area	Fields sampled Number	Stems infested		
		Average Percent	Maximum Percent	Minimum Percent
Kansas:				
Eastern-----	58	7	42	0
Central and western-----	22	0.1	2	0
Missouri:				
Southwestern-----	7	5	21	0
Illinois: <sup>1/</sup>				
Central-----	--	14	--	--
Southern-----	--	2	--	--
Michigan:				
Southern-----	48	8	50	0
Indiana:				
Northern and central-----	242	19	98	0
Southern-----	86	6	44	0
Ohio <sup>1/</sup>	--	20.5	--	--
Kentucky:				
Western-----	22	8	30	0
East-central-----	35	6	24	0
Tennessee:				
West-central and eastern-----	92	4	22	0
Pennsylvania:				
Western-----	15	21	52	0
North-central-----	20	19	52	6
South-central-----	35	8	40	0
Eastern-----	25	12	42	0
Delaware-----	15	2	6	0
Maryland:				
Western-----	25	5	18	0
Eastern-----	15	2	8	0
Virginia:				
Northwestern-----	25	5	18	0
Northeastern-----	35	4	18	0
South-central-----	15	3	6	0
North Carolina:				
North-central-----	45	5	26	0

<sup>1/</sup> Mostly from surveys by State entomologists.



HESSEAN FLY SURVEY - MADE AT HARVEST TIME 1939

Numbers indicate percentage of stems infested.  
Cross-hatching indicates areas of moderate to  
severe infestation.





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## THE MORE IMPORTANT RECORDS FOR SEPTEMBER

Infestation by the white-fringed beetle has been found recently, in the vicinity of Hattiesburg, Miss., extending for several miles along a railroad right-of-way.

The fall armyworm outbreaks in localized areas were reported from Maryland southward to Florida and across the Gulf region to Texas.

The velvetbean caterpillar has been damaging peanuts, velvetbeans, soybeans, and a number of other field crops in Alabama, Georgia, and Florida.

Heavy infestation by the wheat jointworm was reported from Missouri, and minor infestations from Delaware and Maryland.

Hot, dry weather in August and September was apparently favorable to second-brood chinch bug development and rather heavy infestations are reported from Indiana to Nebraska and Missouri.

Codling moth infestation in the Hudson Valley is the most severe in the last 3 years. Heavy infestations are also reported from Virginia, Tennessee, Indiana, and Missouri.

Populations of the plum curculio in the Fort Valley section of Georgia are higher than average.

The pear psylla has been recorded for the first time from Idaho, the infestation in the Spokane area in Washington having been found to extend across the State line.

Heavy infestation of tomatoes by the corn ear worm occurred in central California.

Unusually late damage by the Mexican bean beetle is reported from the South Atlantic States and from the eastern part of the lower Mississippi Valley.

Boll weevil infestations are heavy over most of the Cotton Belt from Texas eastward, especially in the coastal regions. No damage has been reported this year from Missouri and Tennessee.

The cotton leaf worm seriously stripped cotton over extensive areas in Texas. It reached most of the other cotton States too late to cause much damage this year.

The fall webworm is generally prevalent in New England and the South Atlantic States. Heavy infestations also reported from the East Central States southward to the Gulf and westward to Minnesota and Nebraska.

Heavy infestations of locusts by the locust leaf miner are reported from the southern New England States through the Middle Atlantic States to Tennessee.

The elm leaf beetle is again abundant throughout the eastern part of New England.



GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Illinois. W. P. Flint (September 23): Population has declined steadily during latter part of the summer and is now the lowest in the last 5 years at least.
- Missouri. L. Haseman (September 26): Surveys of adult abundance throughout the State during September indicate that, except for a few counties in south-eastern and south-central Missouri, the harmful species have again returned to normal abundance.
- Nebraska. M. H. Swenk (September 14): Complaints of injuries continued to be received from western and central Nebraska up to the close of August. A specimen of Schistocerca obscura F., a rare species for Nebraska, sent in from Gosper County on September 1.
- Kansas. H. R. Bryson (September 25): Not abundant enough to cause trouble to early seeded alfalfa or wheat in the eastern part of the State.
- Oklahoma. C. F. Stiles (September 21): The second brood of Melanoplus mexicanus Sauss. is rapidly approaching maturity in the northern quarter of Texas and Cimarron Counties. Control measures still being used. Infestation over the rest of the State is very light.
- Utah. G. F. Knowlton (September 5): Egg laying and mating much in evidence throughout Utah. (September 16): Adults threateningly abundant, particularly in northern Utah, and moderately abundant in a few, scattered localities in the rest of the State.
- California. S. Lockwood (August 31): Adults of M. mexicanus are numerous in the alfalfa fields of Imperial County. Nymphs observed in only 1 instance. Counts ranged from 10 to 40 per square yard.

JAPANESE BEETLE (Popillia japonica Newm.)

- Rhode Island. A. E. Stene (September 20): Very great increase. Trap collections last year amounted to 800,000 beetles and this year to over 3,000,000. Spreading slowly, although it does not cover any large areas in the State.
- Connecticut. J. P. Johnson (September 23): Emergence delayed somewhat by dry weather. Peak of abundance from 1 to 2 weeks later than usual. Abundance immense, as compared with that of last year.
- New York. M. D. Leonard (September 28): Early in September beetles had apparently entirely disappeared from Flushing, but partly grown grubs were found in fair numbers feeding on grass roots at the surface of the ground. Reports received from Bronxville and White Plains about September 15 that beetles were still feeding on grapevines and several kinds of flowering plants in gardens.

Correction.---The report on Autoserica castanea Arrow from Nassau County, N. Y., in the Insect Pest Survey Bulletin dated July 1, 1939, (p. 279) is in error. Specimens, later identified, proved to be Serica similis Lewis.

BLISTER BEETLES (Meloidae)

Georgia. T. L. Bissell (September 21): Epicauta pennsylvanica Deg. numerous on a wild composite with small yellow flowers at Experiment, central Georgia.

Tennessee. G. M. Bentley (August 23): E. pennsylvanica and E. vittata F. reported as making serious attacks upon soybeans and potatoes in Madison and Weakley Counties.

Alabama. J. M. Robinson (September 20): E. cinerea Forst. reported at Selma on September 15.

Kentucky. W. A. Price (September 25): Adults of E. pennsylvanica found damaging Swiss chard early in September in gardens at Lexington.

SUGAR BEET WIREWORM (Limonius californicus Mann.)

Idaho. F. H. Shirck (September 8): Feeding on young lettuce in several fields near Wilder, southwestern Idaho. On September 7, 8.2 percent of the plants in one field were wilted, indicating damage.

A WEEVIL (Calamagaster setarius Roelofs)

New York. A. S. Travis (August 29): Taken at Millerton, northern Dutchess County, feeding mainly on geranium, hollyhock, and strawberry plants. First discovered last summer but few in number; now so numerous that several houses are swarming with them. (Det. by L. L. Buchanan.)

WHITE-FRINGED BEETLE (Pantomorus leucoloma Boh.)

General. B. M. Gaddis (September 14): Two rather extensive areas of infestation recently found, one of 4,883 acres in the vicinity of Lake Pontchartrain, La., chiefly on uncultivated land; another of over 4,000 acres in the Maybank-Lux area in Forrest and Covington Counties, Miss. Both P. leucoloma and P. peregrinus Buch., formerly referred to as Naupactus n. sp., infest this area. Of lesser extent were infestations recently found at Opp, Covington County, Ala., on grounds of a school and a church, the adjoining cultivated area being apparently free of the beetle; at Blakely Island, across the river from Mobile, Ala., involving approximately 150 acres of waste land and dry docks; and the incipient infestations at Biloxi, Miss., and Crestview, Okaloosa County, and De Funiak Springs, Walton County, Fla.

ARMYWORM (Cirphis unipuncta Haw.)

New York. N. Y. State Coll. Agr. News Letter (September 5): Report of infestation on corn and specimens just sent in from Schenectady County. An earlier report, with specimens, came from Newburgh, Orange County. Both complaints stated that fields of young corn were being destroyed. (Det. by W. T. M. Forbes.)



FALL ARMYWORM (Laphygma frugiperda A. & S.)

Maryland. E. N. Cory (September 2): Reported as attacking corn at Westover, on the Eastern Shore.

Kentucky. W. A. Price (September 25): Destructive in newly sown fields of alfalfa in Jefferson County.

Georgia. D. F. Farlinger (September 4): Very abundant in Clay County, and damage severe on peanuts, soybeans, and velvetbeans. Hay crop will be materially reduced. Scattered infestations noted in other sections of Georgia, but not so severe as in Clay County.

Florida. J. R. Watson (September 21): Much in evidence during the last few weeks.

Mississippi. C. Lyle (September 25): Injury to late corn has continued throughout September in the north-central and northeastern sections of the State. Very abundant at State College.

Texas. R. K. Fletcher (September 7): Seriously injuring alfalfa in Madison County, in eastern Texas.

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Georgia. T. L. Bissell (September 19): Larvae were eating top leaves of peanuts and soybeans at Experiment on September 14. Possibly more damage to peanuts, but this crop is also losing many leaves from leaf spot. Moths numerous among the peanuts.

Florida. J. R. Watson (September 21): Larvae destructive to kudzu in the Monticello section during the latter part of August. Moths very abundant over most of the State.

Alabama. J. M. Robinson (September 20): Active in the southeastern section of the State. Considerable damage done to peanuts, velvetbeans, soybeans, and field peas. In some fields peanuts were completely defoliated. First reported from Geneva on August 10.

YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli Guen.)

Kentucky. W. A. Price (September 25): Cutworms unusually destructive to mid-season tomatoes during the latter part of August at Lexington. Several reared and identified.

Mississippi. C. Lyle (September 25): Specimen, taken from a tung-oil tree, received from Harrison County on September 15.



CEREAL AND FORAGE CROP INSECTS

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Massachusetts. F. W. Poos (August 24): Flaxseeds found in typically injured plants in wheat stubble today at Lenox, Berkshire County. Wheat grown on this farm continuously for a number of years. Only one 12-acre field found infested.

Missouri. L. Haseman (September 26): Owing to the prolonged dry weather throughout the State, there is no evidence of early emergence. Stubble infestation comparatively light, so little concern as to this pest. Little of the crop expected to come up until after the fly-free date.

Kansas. E. T. Jones (September 25): Although many spotted infestations of spring puparia in stubble have been found in fields throughout the eastern half of the State, and although much volunteer is present in most fields, examination of volunteer has shown no infestation. Dissection of puparia in field stubble indicates no emergence, with about 30 percent of the larvae desiccated.

WHEAT JOINTWORM (Harmolita tritici Fitch)

Delaware. F. W. Poos (July 28): Collected in wheat stubble at New Castle today. Not previously reported from Delaware, according to our records.

Maryland. F. W. Poos (July 24): Collected in wheat stubble at Knoxville today. A previous record in Maryland was a description of injury by a farmer in 1909.

Missouri. E. T. Jones (September 25): Severe infestations found on several hundred varieties of winter wheat in test plots at Springfield. One series of 100 varieties, collected on June 23 and examined recently, yielded only 7 varieties with less than 100-percent infestation, and these were probably escapes. Heavy infestations noted in several fields in the vicinity but apparently no commercial damage was sustained.

A WHEAT JOINTWORM (Harmolita vaginicola Doane)

Massachusetts. F. W. Poos (August 24): Collected in wheat stubble at Lenox today. Not previously reported from Massachusetts, according to our records.

CORN

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (September 18): Hot, dry weather late in August and early in September very favorable to second-brood development. By September 16 about half the bugs had become adults, and most of the remaining nymphs had reached the fifth instar. Many cornfields show from moderate to heavy infestations, but no serious damage reported. Considerable migration from corn to winter quarters observed from September 14 to 17.

Illinois. W. P. Flint (September 23): Dry weather late in August and in September has permitted the development of late-hatched chinch bugs. Apparently large numbers will go into winter quarters in central Illinois but it is too early to say how heavy the hibernating population will be.

Missouri. L. Haseman (September 26): Reports and surveys during September indicate that throughout much of the grain-growing section of Missouri there will be a very heavy carryover of adults. Complaints from parts of northern Missouri indicate that they were abundant enough in the late corn to affect seriously the maturity of the crop, where their injury was combined with the effects of drought.

Nebraska. M. H. Swenk (September 14): Inquiries and complaints received from Jefferson, Lancaster, Sarpy, and Douglas Counties during the period August 17 to September 8, inclusive. The Jefferson County report indicates them as damaging grain sorghums; in Lancaster County they were heavily infesting ground that had been in corn or sorghum; while in Sarpy County corn, Sudan grass, and oat and wheat stubble were found to be infested.

Kansas. H. R. Bryson (September 25): More abundant in the eastern third of Kansas than for some time. Adults flying in abundance on about September 15. Indications are that a larger number will go into winter quarters than for a number of years.

#### EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Massachusetts. A. I. Bourne (September 22): Throughout much of the eastern part of the State they have caused less damage than normal. In western Massachusetts, particularly in the Connecticut Valley, both the first and second broods were very abundant and caused heavy losses, especially to sweet corn.

M. M. Cole (September 5): Several fields of sweet corn at Vineyard Haven, Martha's Vineyard, showed broken stalks and tassels but the attack did not affect the yield to any great extent.

Rhode Island. A. E. Stene (September 20): Somewhat more abundant than in previous years.

Indiana. E. V. Walter and D. W. La Hue (September 21): A count of 200 stalks of late corn in a field near La Fayette showed 6.5 percent of the stalks infested. The first 5 infested stalks were dissected and 12 larvae found. In another field of late sweet corn, 22 infested stalks were found in 300 examined, 19 borers being found in 5 stalks.

#### CORN LANTERNFLY (Peregrinus maidis Ashm.)

North Carolina. C. S. Brimley (August 31): Heavy infestation on corn at Castle Hayne, New Hanover County, in the southeastern part of the State.

South Carolina. O. L. Cartwright (September 23): Severe on corn in one eastern locality.



CORN LEAF APHID (Aphis maidis Fitch)

Utah. G. F. Knowlton (August 31): Some corn plants at Greenriver heavily infested.

A RED SPIDER (Acarina)

Utah. G. F. Knowlton (August 31): Some small patches of sweet corn destroyed by red spider at Greenriver; other fields in Emery County from lightly to moderately infested. In one large field of field corn, 25 percent was rather severely injured. Also injuring corn near Logan, Cache County.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (September 23): Both larvae and adults collected in the infested part of the San Joaquin Valley throughout the summer. The average number collected per 100 sweeps of a net on September 22 for the different fields ranged from 0 to 13 larvae and from 0 to 17 adults. No specimens taken in the Pleasanton region, and in the country adjacent to the San Francisco Bay the larval count ranged from 1 to 6 and the adult count from 0 to 2.

ALFALFA CATERPILLAR (Colias eurytheme Bdv.)

California. A. E. Michelbacher (September 23): During the latter part of August larvae did considerable damage to alfalfa in several fields in the northwestern part of the San Joaquin Valley. Serious loss restricted to the area near Westley. At present scarce in all fields.

SORGHUM

A WEEVIL (Anacetrinus deplanatus Csy.)

Kansas. H. R. Bryson (September 1): Found for the first time attacking sorghum in Kansas. Discovered when it destroyed practically an entire row of sorghum in nursery at Manhattan. Twenty beetles reared from the larvae taken from the stalks. Also reared from barnyard grass. (Det. by L. L. Buchanan.)

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. J. W. Ingram and E. K. Bynum (September 25): Numerous dead sugarcane tops apparent in fields. These observations, infestation counts, and reports of unusually heavy infestations in seed cane, which is being planted, indicate that damage may be as heavy, or heavier, than in 1938.



RICE

RICE STALK BORER (Chilo plejadellus Zinck.)

Louisiana. W. A. Douglas (September 16): In a survey of the rice section, 2.1 percent of all rice stalks were found to have white heads caused by this borer and by the sugarcane borer (D. saccharalis). Some fields had as high as 6 percent of white heads, from which no grain was produced.

Texas. W. A. Douglas (September 16): The percentage of white heads caused by this borer and the sugarcane borer in Texas ricefields was found to average 2.3 in a survey of representative fields. Injury of this type reached as high as 20 percent in a field near Katy, Harris County, southeastern Texas.

FRUIT INSECTS

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Oklahoma. F. A. Fenton (September 23): Reported on plum trees in Grant, Choctaw County.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Massachusetts. A. I. Bourne (September 22): Of average abundance in the apples being harvested. Apparently very bad, in some of the best orchards.

New York. D. W. Hamilton (September 20): Injury by second-brood larvae continued to be heavy through August 28 at Poughkeepsie. Injury throughout the Hudson Valley more severe than that of the last 3 years, and the number of orchards with heavy populations has increased. All larvae had ceased pupating by August 20. Only a few adults captured in bait traps after September 1.

Virginia. A. M. Woodside (September 23): Flight of first-brood adults continued from late in June until the first week in September. Infestation heavy in central Virginia.

Tennessee. G. M. Bentley (August 29): The second brood has been serious in the apple-growing areas of the State.

Indiana. L. F. Steiner (September 22): In most orchards in the Vincennes area the number of second-brood adults that came to bait traps during the peak of activity, August 24 to September 5, was less than during the first-brood peak in mid-July. Infestation well above normal, and an unusually heavy carry-over is anticipated.

Missouri. L. Haseman (September 26): Third-brood moths and larvae picked up in abundance in practically all sections of Missouri. In central Missouri most of the larvae are approximately half grown.

Washington. E. J. Newcomer (September 15): Somewhat more abundant than usual in the Yakima Valley on apple and pear, owing to continued hot weather in August.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Missouri. L. Haseman (September 26): Third-stage, second-brood larvae have been appearing in small colonies during the latter half of September in central Missouri.

LEAF CRUMPLER (Mineola indigenella Zell.)

Minnesota. A. G. Ruggles (August): Reported on apple at Clarkfield.

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

Missouri. L. Haseman (September 26): While less abundant than in recent years in central Missouri, young as well as mature apple trees are showing heavy infestations. Most of the larvae are 1 inch in length with an occasional, recently hatched larva showing up.

APHIDS (Aphidae)

Massachusetts. A. I. Bourne (September 22): Very few reports received in apple aphids in serious abundance. In earlier reports this season all species were given as unusually abundant. No serious damage observed or reported.

Oregon. E. J. Newcomer (August 22): Aphelinus mali Hald. very abundant and parasitizing woolly apple aphids (Eriosoma lanigerum Hausm.) in an apple orchard at Goshen, Lane County. B. G. Thompson, Oregon State College, states that the nearest point of liberation of this parasite was at Monroe, about 25 or 30 miles northwest of Goshen.

APPLE LEAFHOPPERS (Cicadellidae)

Massachusetts. A. I. Bourne (September 22): Apparently somewhat less abundant than last year, and the infestation over the State seems to be spotty. Generally it would be considered lighter than normal.

Virginia. A. M. Woodside (September 23): Common in many apple orchards. The white apple leafhopper (Typhlocyba pomaria McA.) is generally the most numerous but in some orchards Erythroneura hartii Gill. is more abundant.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Massachusetts. A. I. Bourne (September 22): Not particularly troublesome in the apples already picked. Apparently only moderately abundant, no more so than in 1938, and considerably less abundant than 4 or 5 years ago.

Connecticut. P. Garman (September 21): Unusually abundant, and infestation severe in many localities.

A MEALYBUG (Pseudococcus sp.)

South Carolina. O. L. Cartwright (September 23): Of considerable importance to apple in Clemson College orchard.

PEACH

PLUM CURCULIO (Conotrachelus nemophar Hbst.)

Massachusetts. A. I. Bourne (September 22): In many orchards more troublesome to control than usual. Seasonal factors apparently made it more difficult to adjust treatments to its life history.

Tennessee. G. M. Bentley (August 30): Second brood on peaches serious, where treatments were not given at the proper time.

Georgia. O. I. Snapp (September 20): Jarring records show a considerable increase in adults in peach orchards at Fort Valley, central Georgia, during the period August 21-28, owing to the emergence of second-generation individuals from the soil. Infestation heavier than that of an average year. Most of the adults have left the trees for places of hibernation. Population in hibernation at the beginning of the 1939-40 season heavier than average.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Massachusetts. A. I. Bourne (September 22): Reports indicate that on early varieties of peach the infestation was somewhat lighter than usual and decidedly lighter than that of last year. Reports on later varieties not complete.

M. M. Cole (September 5): Considerable dying back of new-growth twigs in the spring at Vineyard Haven, Martha's Vineyard, and injury to fruit later, but damage light.

South Carolina. O. L. Cartwright (September 23): Above average in abundance at Clemson during the season.

Georgia. T. L. Bissell (September 6): Infested shoots from peach trees sent in with larvae from Cordale, southern Georgia. At Griffin, central Georgia, recently found in Photinia serrulata and in English cherry-laurel (Lauro-cerasus officinalis).

Mississippi. C. Lyle (September 25): Injured peach twigs received from Attala County on August 17, and injured apple and peach twigs from Winston County on September 18. Reports of injury to peach received from Holmes and Jones Counties, from southern Mississippi, and from the Meridian district.

Ohio. E. W. Mendenhall (September 10): Injurious in apple fruits in central Ohio, especially where no control measures have been used.



Indiana. L. F. Steiner (September 21): During the period from May 8 to September 20 in the Vincennes area, 310 codling moth bait traps located in 4 orchards captured 3,056 moths. No peach trees within  $\frac{1}{4}$  mile of any of these traps. One of the orchards was untreated and located  $\frac{1}{8}$  mile from the nearest peaches. From wormy apples collected in this orchard late in August, 2,150 moths have emerged. Abundance throughout the season, about 10 percent of the total catches being made in May, suggests that this pest can readily develop from year to year on nothing but apples.

Missouri. L. Haseman (September 26): Moths appearing in goodly numbers in bait jars in central Missouri since the middle of September. Late larvae very abundant in late peaches and apples. Reported on September 15 that a fourth or partial fourth, brood is indicated in southeastern Missouri, although emergence has begun to drop off.

PEACH BORER (Conopia exitiosa Say)

Maryland. E. N. Cory (September 1): Found on flowering cherry at College Park.

Mississippi. C. Lyle (September 25): Complaints of injury received from Lawrence and Newton Counties the first week in September. Reported as abundant in untreated trees throughout northeastern Mississippi.

Texas. R. K. Fletcher (September 1): Found in Bell County.

PEAR

PEAR PSYLLA (Psylla pyricola Foerst.)

Idaho. L. Childs and E. J. Newcomer (August 29): A few adults found on pear trees in an orchard on U. S. Highway No. 10,  $2\frac{1}{2}$  miles east of the Washington-Idaho State Line and 2 miles west of Post Falls, Idaho. This locality is in the Spokane Valley, and this is part of the infestation centering about 10 miles west in Washington.

PEAR LEAF BLISTER MITE (Eriophyes pyri Pest.)

Oregon. S. C. Jones (September 22): Foliage severely infested in many orchards in Benton County. Almost all of the orchards included in a recent survey infested.

PLUM

PLUM GOUGER (Anthonomus scutellaris Lec.)

Minnesota. A. G. Ruggles (August): Reported on plum at Minneapolis.

RASPBERRY AND BLACKBERRY

RASPBERRY CANE BORER (Oberoa binaculata Say)

Minnesota. A. G. Ruggles (August): Found on raspberry at Mankato and Saint Paul.

RASPBERRY ROOT BORER (Berbercia marginata Harr.)

- Michigan. E. I. McDaniel (September 23): Specimens of blackberry crown borer received from Charlevoix.
- Oregon. W. D. Edwards (September 21): Infestations in average raspberry plantings common at Gresham. This pest promises to be one of major importance in commercial-production areas.

GRAPE

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

- New York. F. Z. Hartzell (September 23): Not so numerous in the Grape Belt of Chautauqua County as in 1938, but very abundant in some vineyards, and general throughout the Grape Belt. Damage rather serious.
- Ohio. G. A. Runner (September 22): Flight of moths of the late brood, as indicated by bait traps in the Sandusky area, continued to the third week in September, a considerable number being taken as late as September 18. While the number of eggs parasitized by Trichogramma sp. during the first half of August which is the period of heaviest egg deposition of the late brood of moths was low, Trichogramma increased very rapidly after August 15, according to weekly counts in a vineyard at Vermilion.

GRAPE LEAFHOPPERS (Erythroneura spp.)

- Ohio. G. A. Runner (September 22): Many vineyards in the Sandusky area and in grape districts farther east show severe leaf damage, this being increased by the intensely hot weather.
- Nebraska. M. H. Swenk (September 14): Reports of the grape leafhopper, (E. com Say) as attacking grapevines in Boone, Platte, and Cheyenne Counties received on August 21 and 22. Woodbine in Platte County reported as infested on September 2.
- Utah. G. F. Knowlton (September 15): Of the foliage on Virginia creepers at Logan 95 percent has been killed, owing to heavy populations of E. comes and E. comes ziczac Walsh. Much damage done to some varieties of grapes at Logan, Ogden, and Farmington.

GRAPE PHYLLOXERA (Phylloxera vitifoliae Fitch)

- Minnesota. A. G. Ruggles (August): Found on grape at Preston and Lewiston.

A GRAPE TUBE GALL (Cecidomyia viticola O. S.)

- Nebraska. D. B. Whelan (September 14): On grape in Douglas County on August 16.

PECAN

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

South Carolina. W. C. Nettles (September 23): Above normal in abundance.

Mississippi. C. Lyle (September 25): Specimens and injured pecan nuts received from Covich County on September 11. Injured pecan nuts observed at State College on September 21.

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Mississippi. C. Lyle (September 25): Reported as injuring pecan trees in Marion County on August 25. From light to medium infestation reported as general in the Meridian district.

TWIG GIRDLER (Oncideres cingulatus Say)

South Carolina. F. Sherman (September 23): Twigs severed by hickory and pecan twig girdler showed up at Clemson early in September.

Florida. J. R. Watson (September 21): First attack observed in Alachua County the first week in September.

CITRUS AND OTHER SUBTROPICAL FRUITS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Florida. J. R. Watson (September 21): On the wing during the first half of September. Brood seems to be heavier than for several years in most sections.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Arizona. C. D. Lebert (September 25): Numerous on clusters of ripening dates on September 11 and on pomegranates on September 21 in the Phoenix area. Practically all of the pomegranates punctured and rendered unusable.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Mississippi. C. Lyle (September 25): Reported as doing serious damage to turnips in Lawrence County. This is the earliest record this fall.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Kansas. H. R. Bryson (September 10): Injury continuing in the western part of the State. At Burdett 125 beetles removed from around the roots of 1 tomato plant. Additional reports of injury received during the month from Dodge City.



CUCUMBER BEETLES (Diabrotica spp.)

Georgia. T. L. Bissell (August 26): Young squash in Fayette County attacked, mainly by D. vittata F.

O. I. Snapp (September 18): D. duodecimpunctata F. moderately abundant in a 14-acre field of cucumbers at Fort Valley, central Georgia.

Missouri. L. Haseman (September 26): Striped and spotted cucumber beetles, which were extremely abundant a month ago in central Missouri, have largely disappeared since early in September.

M. D. Leonard. (September 28): Considerable damage reported as being done by D. duodecimpunctata to the flower parts of several hundred large chrysanthemum plants at Saint Louis.

Nebraska. M. H. Swenk (September 14): D. vittata reported as attacking aster plants in Gage County on August 16.

D. B. Whelan (September 14): D. vittata and D. duodecimpunctata on squash at Lincoln late in August and early in September.

Kansas. H. R. Bryson (September 23): D. duodecimpunctata more abundant than in a number of years. Numerous enough to cause injury to blossoms of late squash.

Oklahoma. F. A. Fenton (September 23): D. vittata reported in Kansas, Delaware County.

Arizona. C. D. Lebert (September 25): The western striped cucumber beetle, D. trivittata Mann. and D. tricineta Say were numerous on beans, cucumbers, and squash in several Phoenix localities on September 11. Severe defoliation was in progress.

THRIPS (Frankliniella spp.)

Virginia. F. W. Poos (September 12): Specimens, collected on peanuts near Holland in the southeastern part of the State, in June, and reported as very injurious to young peanut plants. (Identified by F. Andre as F. fusca Hinds and F. tritici Fitch.)

FALSE CHINCH BUG (Nysius ericae Schill.)

Virginia. H. G. Walker (September 1): Nymphs reported as very abundant on potatoes at Painter.

Utah. G. F. Knowlton (September 20): A few home gardens damaged in Tooele and Millard Counties late in August. Generally less injurious than in 1938.

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POTATO AND TOMATO

POTATO TUBER WORM (Gnorimoschoma operculella Zell.)

Alabama. J. M. Robinson (September 20): Reported on potatoes at Cullman, in northern Alabama, on September 13.

CORN EAR WORM (Heliothis armigera Hbn.)

California. A. E. Michelbacher (September 23): Infestation in tomatoes more serious than a year ago. Survey of fields in Sacramento County on September 13 showed the infestation for the different fields to range from 0.5 to 6 percent. In Yolo County on September 14 infestation ranged from 2 to 14 percent. All of the 12 fields examined in this county had been treated at least once. In Santa Clara County on September 18 the infestation ranged from 0.5 to 21.25 percent. In other localized areas that have been surveyed the infestation has been found to exceed that of a year ago.

HORNWORMS (Protoparce spp.)

Rhode Island. A. E. Stene (September 20): Tomato and tobacco worms have been sent in more frequently than usual.

Nebraska. D. B. Whelan (September 14): P. sexta Johan. very numerous on tomatoes at Lincoln.

A MEALYBUG (Pseudococcus sp.)

Oklahoma. C. F. Stiles (September 21): Potatoes, sent in from Garvin County, were heavily infested; especially numerous around the eyes of the potatoes.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Massachusetts. A. I. Bourne (September 22): Apparently much less abundant generally throughout the State than for the last several years.

Virginia. O. I. Snapp (August 29): Heavy infestation on lima beans at Winchester, northern Virginia, and some crops ruined, where control measures were not used.

South Carolina. F. Sherman and W. C. Nettles (September 23): Above average at Clemson for so late in the season. Control measures much used.

Georgia. T. Thompson (September 23): Considerable damage to beans in Thomas, Colquitt, Mitchell, and Worth Counties, southern Georgia.

Florida. J. R. Watson (September 21): Continuing to be very destructive around Havana, Gadsden County. It is confined to the extreme northern part of Florida.

- Kentucky. W. A. Price. (September 25): Unusually injurious in eastern Kentucky.
- Tennessee. G. M. Bentley (September 11): Extremely bad in all parts of the State on beans not properly treated.
- Alabama. J. M. Robinson (September 20): Moderately abundant at Auburn.
- Mississippi. C. Lyle (September 25): Specimens received from La Fayette County on September 12, and complaints of serious injury to beans received from Choctaw, Lauderdale, western Oktibbeha, and Panola Counties. Reports of defoliation of late beans received from the Meridian and northeastern districts.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

- Mississippi. C. Lyle (September 25): Specimens received on August 24 from Hinds County, where they were feeding on beans. More than the usual amount of damage to soybeans and garden beans reported from the southern Delta and the east-central sections, while light damage to garden beans was reported from the Jackson district. Observed in unusually large numbers on soybean and garden beans at State College about September 15.
- Louisiana. C. O. Eddy (September 22): Extremely abundant in soybean and cowpea fields, and in garden beans.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

- Maryland. E. N. Cory (September 19): Observed on late beans at Salisbury.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

- Mississippi. C. Lyle (September 25): Specimens of different stages received on September 14 from Forrest County, with the information that they were taken from beans.
- Texas. M. J. Janes (August 19): Beans damaged in Galveston County.

A PLANT BUG (Opistheuria glandestina Van D.)

- Mississippi. C. Lyle (September 25): Specimens sent in from Hinds County on August 30 with the statement that they were feeding on beans.

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

- Arizona. C. D. Lebert (September 25): Extremely numerous in two fields of beans late in August and early in September in the Phoenix area. Egg punctures numerous in the stems of the plants at soil level, and about 25 percent of the plants dead or dying.

CABBAGE

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Michigan. E. I. McDaniel (September 23): Abundant in cabbage fields at Menasha.

CABBAGE LOOPER (Autographa brassicae Riley)

New York. H. Glasgow (September 23): Unusually abundant on late cabbage in Ontario County, western New York. Severe injury began to be apparent the last week in August and has steadily increased until serious damage is now general.

Texas. M. J. Janes (August 22): Half-grown larvae beginning to cause serious damage to mustard in Galveston County.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Kentucky. W. A. Price (September 25): Common on cabbage and broccoli early in September in the vicinity of Lexington.

Mississippi. C. Lyle (September 25): Reports of injury to turnips and collards received from the Meridian district.

APHIDS (Aphidae)

Georgia. T. Thompson (September 20): Severe damage to collards observed in Brooks, Mitchell, and Thomas Counties, southern Georgia.

SQUASH

SQUASH BORER (Melittia satyriniformis Hbn.)

Massachusetts. A. I. Bourne (September 22): Moderately abundant, judging from condition of crop.

SQUASH BUG (Anasa tristis Deg.)

Minnesota. A. G. Ruggles (August): Observed on pumpkin at Clarkfield; on squash at Saint Paul and at Minneapolis.

Missouri. L. Haseman (September 26): Squash bugs began to seek winter quarters around the middle of September in central Missouri, owing to the severe drought.

Nebraska. D. B. Whelan (September 14): All stages common on squash at Lincoln late in August and early in September.

Kansas. H. R. Bryson (September 23): Sufficiently abundant to be the determining factor in the production of squash in the vicinity of Manhattan and in other truck-growing areas. Especially injurious to the squashes and pumpkins remaining in the field after the vines have been destroyed.



Oklahoma. F. A. Fenton (September 23): Reported from Kansas, Delaware County.

### MELONS

#### MELONWORMS (Diaphania spp.)

Pennsylvania. T. L. Guyton (September 7): D. hyalinata L. numerous on a few green plants at Harrisburg.

Georgia. T. L. Bissell (August 26): Pickleworms (D. nitidalis Stoll) severe on bearing squash in Spalding County, central Georgia.

Louisiana. C. O. Eddy (September 22): Both melon and pickleworms extremely active in the Cucumber Belt in the Florida Parishes, extreme southern Louisiana, on the east side of the Mississippi River.

#### MELON APHID (Aphis gossypii Glov.)

Georgia. O. I. Snapp (September 18): Moderate infestation in a 14-acre field of cucumbers at Fort Valley, central Georgia.

Louisiana. C. O. Eddy (September 22): Abundant in many fields of cucumbers in Florida Parishes, extreme southern Louisiana.

Nebraska. M. H. Swenk (September 14): Complaint of cucumber plants being attacked received from Harlan County on August 21.

Utah. G. F. Knowlton (August 30): Some cantaloup and watermelon vines at Green-river seriously damaged. Untreated plants being destroyed.

#### A PLANT BUG (Euryophthalmus convivus Stal)

Arizona. C. D. Lebert (September 25): The bordered plant bug was numerous on cucurbits in the Phoenix area on September 11.

### ONIONS

#### ONION THRIPS (Thrips tabaci Lind.)

Utah. G. F. Knowlton (September 20): Injury approximately average in Utah during the last season, more severe, local infestations occurring on some farms.

### LETTUCE

#### A ROOT APHID (Aphiidae)

California. R. E. Campbell (September 1): Reported that cold weather has allowed the development of considerable root aphid on lettuce in the Salinas-Watsonville district. This has been a serious factor in the harvest of the last 2 weeks. Now thought to be pretty well under control.

STRAWBERRY

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Nebraska. M. H. Swenk (September 14): Reported on September 14 as attacking strawberry plants in Hall County.

STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Maryland. E. N. Cory (September 16): Reported as attacking strawberries in Prince Anne County.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

General. B. M. Gaddis (September 14): Survey made of over 500 properties outside the regulated areas in Georgia, Mississippi, and Texas. In Texas a survey of 461 properties in 43 counties, including a commercial area in eastern Texas, resulted in finding 3 infestations, which were located in Brazos County. Within the regulated areas of Alabama, Georgia, Mississippi, and Texas, 11 infested properties were located in August.

Georgia. K. L. Cockerham (September 16): Specimens apparently killed by some disease. Collected at Saint Simons and Sea Islands.

Florida. J. R. Watson (September 21): Sent in from Trenton, Gilchrist County. Infestation apparently rather severe.

SWEETPOTATO LEAF BEETLE (Typophorus viridicyaneus Crotch)

Georgia. T. Thompson (September 18): From minor to medium damage to tubers of the new crop of sweetpotatoes prior to harvest in Colquitt, Grady, and Thomas Counties, southern Georgia.

SUGAR BEETS

BEET WEBWORM (Loxostege sticticalis L.)

Kansas. H. R. Bryson (August 30): Reported as abundant at Hays and Ellis and as causing considerable defoliation to Russian-thistle. No recent reports of injury to field crops.

Utah. G. F. Knowlton (August 31): Injury not severe in sugar beet fields at Price and Greenriver. Some coming to trap lights at Syracuse and Logan.

HAWAIIAN BEET WEBWORM (Hymenia fascialis Cram.)

Texas. M. J. Janes (August 23): Found on beets and weeds in Galveston County.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. G. F. Knowlton (August 31): Rather scarce in sugar beet and cantaloup fields examined at Greenriver. Very little curly top on melons and cucumbers at Greenriver.

TOBACCO

HORNWORMS (Protoparce spp.)

Tennessee. G. M. Bentley (September 16): Second broods of I. sexta Johan. and P. quinquemaculata Haw. on tobacco have had an irregular emergence, owing to the extended drought. Generally over the tobacco-growing areas there has been less injury from the second brood than normal.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

Virginia. S. B. Fenne (September 27): Severe injury in Isle of Wight, Nansemon, Greensville, and Brunswick Counties. Considerable late treatment used but rain washed it off. Yield probably reduced at least 50 percent in many instances.

Georgia. P. M. Gilmer, et al. (September 2): Still present in considerable numbers in untreated cotton but not maintaining their numbers on fields treated within the last week in Tift, Cook, Berrien, Lowndes, and Echols Counties. Midsummer migration definitely over, and some indications of fall migrant movements. Squares now showing heavy feeding punctures and fewer egg punctures.

Florida. C. S. Rude (September 23): Population heavy in all of the fields examined in Alachua, Marion, and Lake Counties. Cotton plants putting on much new growth, and the new squares are 100-percent infested. A large increase in the weevil population in Lake County during the last 2 weeks about the same as it was last year.

Alabama. J. M. Robinson (September 20): Very abundant at Auburn.

Mississippi. C. Lyle (September 25): Reports indicate that many bolls are injured in the southern Delta section and that adults are very numerous in the younger cotton throughout the northern half of the State.

E. W. Dunnam, et al. (September 22): Some weevils are emerging as late bolls open in Washington County. Parasitization apparently higher than normal in grubs in cotton bolls. Population not increasing, as there is practically no second growth. Estimated population still about 50 percent of that last year at this time.

R. L. McGarr and assistants (September 9): Very abundant in most of the cotton examined this week in Oktibbeha County. Present conditions indicate that a large number will be ready for hibernation.



Louisiana. R. C. Gaines and assistants (September 16): Apparently numerous in fields where squares are abundant in Madison Parish. Most cotton fields have very few squares or young bolls.

Texas. K. P. Ewing, et al. (September 2): Very numerous in practically all of the late-planted cotton in McLennan, Falls, and Limestone Counties, the infestation running practically 100 percent of punctured squares. Some control measures being used.

THURBERIA WEEVIL (Anthonomus grandis thurberiae Pierce)

Arizona. W. A. Stevenson (September 16): A recent examination of one field of short staple cotton at Tubac, Santa Cruz County, showed 3 percent of the bolls to be infested. Larvae all very small, indicating that the adults had only recently entered the field.

BOLLWORM (Heliothis armigera Hbn.)

Georgia. P. M. Gilmer, et al. (September 9): Damage practically over in Tift, Cook, Berrien, Lowndes, and Echols Counties. Total damage on Sea Island cotton amounts to from 6 to 10 percent of the boll crop, a very serious year for this region.

Mississippi. R. L. McGarr and assistants (September 9): A few noted in some of the cotton examined this week in Oktibbeha County.

E. W. Dunnam, et al. (September 22): A few damaged bolls can be found in late cotton in Washington County.

Texas. K. P. Ewing, et al. (September 2): Moths fairly abundant for some time in all of the late-planted cotton in McLennan, Falls, and Limestone Counties. No larvae have hatched and practically no damage observed in this cotton recently.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Michigan. E. I. McDaniel (September 23): Taken at light traps on September 15 and occurring in numbers on September 22. Not much loss expected this year, since most of the fruit is harvested.

Tennessee. G. M. Bentley (September 21): Not in damaging numbers in any of the cotton-growing areas in Tennessee. About 2 weeks ago small patches of injury were observed in Fayette, Shelby, and Tipton Counties.

Georgia. P. M. Gilmer, et al. (September 2): Present in heavy numbers in localized sections of Echols and Lowndes Counties. Some fields show complete stripping, others no damage. Now pupating.

Florida. C. S. Rude (September 9): A few noticed in three fields in Marion and Lake Counties.

Mississippi. C. Lyle (September 25): Reported as rather numerous in Washington County, the southern Delta, the southwestern section, and the Jackson district. Some fields almost defoliated. From light to medium infestation reported in other sections of the State. At State College only a few light infestations observed.

Louisiana. R. C. Gaines and assistants (September 23): Defoliation has continued in Madison Parish during the last week. It is estimated that from 50 to 75 percent of the cotton has been defoliated.

Texas. F. L. Thomas (August 30): Present in Dickens County, northwestern Texas and in Crosby, Lubbock, and Lynn Counties, on the southern plains. In the latter area irrigated cotton may suffer some damage where no control is used. Late irrigation likely to bring about injury. In central and west-central Texas abundant in the late or succulent cotton, but not expected to damage the mature cotton.

K. P. Ewing, et al. (September 2): Nearly all late-planted cotton infested in McLennan, Falls, and Limestone Counties and, wherever treatment is not being applied, plants are gradually being stripped.

A. J. Chapman (September 9): Cotton defoliated in most of the fields in Presidio County. This generation of larvae now in the pupal stage.

F. C. Bishopp (September 17): A considerable number of moths observed night on show windows and especially around red and blue neon signs at Dallas.

Arizona. W. A. Stevenson (September 2): The first larvae were found at Sahuarita Pima County, on August 28, or exactly 1 month later than in 1938. Larvae were in the second or third instars and few in numbers, so no commercial damage is anticipated. Larvae reported unofficially from Marana on August 17.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (September 9): Green boll infestation counts made in 17 fields in Presidio County since September 1. These fields averaged 26 percent infestation, with an average of 2.28 larvae per infested boll, and 4.18 bolls per plant. Average infestation in the same fields last year was 95.8 percent, with an average of 6.5 larvae per infested boll and 3.5 bolls per plant.

L. C. Fife (September 18): Collected on 7 properties in the vicinity of Brownsville on September 13, 14, and 15. Three larvae collected from Malvaviscus drummondii and 16 from okra. (Det. by C. Heinrich.)

COTTON STAINER (Dysdercus suturellus H. S.)

Florida. C. S. Rude (September 23): Abundant in all fields in the southern part of Lake County and present in some fields in the northern part of the county. Scattered infestations observed in fields in Marion and Alachua Counties. Owing to the lateness of the season, it seems doubtful that any serious damage will be done.



## APHIDS (Aphidae)

Georgia. P. M. Gilmer, et al. (September 9): A few present in Tift, Cook, Berrien, Lowndes, and Echols Counties. Some lint damage noted in a few fields.

Mississippi. C. Lyle (September 25): Some local heavy infestations of Aphis gossypii Glov. reported from the Meridian district. Considerable damage reported as following treatment for the boll weevil in several sections.

E. W. Dunnam, et al. (September 16): The general infestation is increasing in Washington County. Now apparent that the population will equal that of last year. (September 22): Peak of damage past. Most cotton has matured out to the top leaves and migration has taken place, resulting in a general scattering of the population. Many winged forms present on almost all the leaves.

Louisiana. R. C. Gaines and assistants (September 2): Infestation still heavy in many fields in Madison Parish. Heavy shedding of cotton leaves has occurred in many fields not heavily infested. (September 16): Infestations have greatly decreased, owing to the work of their insect enemies.

## WHITEFLIES (Aleyrodidae)

Mississippi. E. W. Dunnam, et al. (September 10): Abundant in plots in Washington County that have been treated. (September 22): Almost wiped out by a parasite thought to be Eretmocerus haldemani How., which was thus identified when collected last season. (Det. by A. B. Gahan.) Not 1 whitefly emerged from 1,000 pupae. Many leaves almost black with pupae but adults hard to locate. Laboratory tests show that a sample that is not 100-percent parasitized is hard to find.

## FOREST AND SHADE-TREE INSECTS

### TWIG PRUNER (Hypermallus villosus F.)

Maryland. E. N. Cory (September 15): Found at Annapolis on elm, hawthorn, and apple.

Missouri. L. Haseman (September 26): Considerable attention attracted by this pest in September, although much of the cutting of the twigs was done earlier. Very abundant again this fall.

### FALL WEBWORM (Hyphantria spp.)

New England. J. V. Schaffner, Jr. (September 9): Infestations appear to be on the increase in parts of New England, heavy infestations having been observed in Windham County, Conn., and Providence County, R. I. Webs noted as rather common late in August through eastern Massachusetts, southeastern New Hampshire, and southern Maine.



E. P. Felt (September 26): H. textor Harr. has been somewhat common, though not excessively abundant, late in August and in September in southwestern New England and southeastern New York.

Massachusetts. A. F. Burgess (August): The fall webworm is apparently abundant throughout Berkshire County, Mass.

South Carolina. F. Sherman (September 23): Above average in the lower Piedmont appearing to be most abundant on persimmon.

South Carolina. B. H. Wilford (September 25): Native persimmon trees in Newberry County found to be severely defoliated and covered with silk webs, apparently of H. cunea Prury.

Georgia. O. I. Snapp (September 10): From moderate to heavy infestation on persimmon from Madison, through Eatonton to Macon, in north-central and central Georgia. (September 12): The infestation on pecan at Fort Valley, central Georgia, is now heavier than that of an average year. A dozen or more nests have been observed on single trees and there has been considerable defoliation.

Florida. J. R. Watson (September 21): Much more in evidence than during the average fall. Pecans and persimmons particularly suffered.

A. H. Madden (September 6): Fall webworms (Hyphantria spp.) abundant on various deciduous trees in the vicinity of Quincy.

Tennessee. G. M. Bentley (September 14): Extremely abundant in parts of western and central Tennessee. Heaviest infestation ever seen by the writer. Many trees and bushes completely defoliated, the webs often completely covering the trees or shrubs. Trees most highly infested are maple, elm, sycamore, hackberry, hickory, persimmon, sumac, and walnut.

Mississippi. C. Lyle (September 25): General heavy infestation over most of the State. Persimmon trees stripped in most sections. Infestation reported as lighter in the southwestern part of the State.

Ohio. E. W. Mendenhall (September 15): Abundant on wild cherry and in apple orchards in central Ohio.

Illinois. W. P. Flint (September 23): Unusually abundant throughout central and northern Illinois. In many sections fall webworms almost defoliated mulberry and Osage orange and caused considerable loss of foliage to elm. The only trees noticeably not affected were the ash.

Minnesota. A. G. Ruggles (August): Webworms reported on walnut at Owatonna.

Nebraska. M. H. Swenk (September 14): Report from Douglas County on September 14 that this insect was troublesome on boxelder, mulberry, and other trees.

GYPSY MOTH (Porthetria dispar L.)

New Hampshire. M. Kisliuk, Jr. (August 28): Egg masses numerous on pine and oak trees in an old forest cluster not more than 2 acres in extent on the south bank of Lake Franklin Pierce, near Hillsboro. As many as 35 egg masses counted on 1 pine-tree trunk.

BROWN-TAIL MOTH (Nygmia phaeorrhoea Donovan.)

Maine. J. V. Schaffner, Jr. (September 2): Apparently locally abundant in the vicinity of Harpswell and Yarmouth. Rather heavy infestation on apple and pear trees at East Harpswell. Insect in the egg stage.

CHAIN-SPOTTED GEOMETER (Cingilia catenaria Drury)

Connecticut. T. P. J. Duffy, Jr. (September 21): A heavy flight occurred in West Haven on the night of September 20.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Maryland. E. N. Cory (September 22): Attacking evergreens in Prince Georges, Montgomery, and Frederick Counties.

Michigan. E. I. McDaniel (September 23): Received from Lansing and Detroit. While this species has been reported previously from Hillsdale and other points on the southern boundary of the State, it has never been able to establish itself. The Detroit infestation is apparently 2 years old.

Tennessee. G. M. Bentley (September 20): Many have occurred on narrow-leaved evergreens on estates, but no heavy infestation in the cedar or hemlock growths.

Mississippi. C. Lyle (September 25): Considerable damage reported in the north-eastern part of the State.

ASH

CARPENTER WORM (Prionoxystus robiniae Peck)

Nebraska. M. H. Swenk (September 14): Ash trees in Polk County reported as infested on August 28.

BANDED ASH BORER (Neoclytus caprea Say)

Minnesota. A. G. Ruggles (August): Reported on ash at Breckenridge.

AN ASH FLOWER GALL (Eriophyes fraxiniflora Felt)

Minnesota. A. G. Ruggles (August): Reported on ash at Sauk Centre.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

Colorado. F. H. Gates (September 29): Found feeding on birch and poplar.

Infestation rather general in home plantings.

BOXELDER

BOXELDER BUG (Leptocoris trivittatus Say)

- Maryland. E. N. Cory (September 15): Damaging boxelder at Annapolis.
- Michigan. E. I. McDaniel (September 23): Reported from Chesaning and Jackson, where it was troublesome about houses.
- Missouri. A. C. Burrill (September 22): Attacking boxelder; so abundant in two places in Jefferson City as to be a nuisance; however, they were less abundant than in the average year.
- Nebraska. M. H. Swenk (September 14): Complaints of annoyance received from Otoe and Douglas Counties on August 31 and September 9, respectively.
- Utah. G. F. Knowlton (September 15): Extremely abundant and entering homes, causing annoyance in some parts of northern Utah. They have been more annoying since the beginning of cooler weather.

CATALPA

CATALPA SPHINX (Ceratomia catalpae Bdv.)

- Michigan. E. I. McDaniel (September 23): Specimen received from Sturgis, where the infestation in and around the town is of several years' standing.

COTTONWOOD

AN APHID (Periphyllus populicola Thos.)

- Nebraska. M. H. Swenk (September 14): Young cottonwood trees in Nuckolls County reported on September 1 to be suffering from attack by the cloudy-winged cottonwood aphid.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

- New Hampshire. J. V. Schaffner, Jr. (September 4): Foliage of elm trees in Rye badly browned from feeding.
- Massachusetts. A. I. Bourne (September 22): Throughout the eastern part of the State the infestation seems to be particularly severe, and serious browning of foliage is evident throughout most of the towns in the southeastern counties.
- Connecticut. A. F. Burgess (August): Again abundant.



SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus Marsham)

Connecticut. P. Wallace (September 20): Has spread to East Hartford, Manchester, Cromwell, Madison, Deep River, and Saybrook. Former distribution included almost all towns west of the Connecticut River except Middlesex County, where it was reported previously from Middletown and Middlefield only. Glastonbury was the only town east of the Connecticut where it had been found, despite a careful survey in 1937 and 1938. Abundance much greater than usual.

RED ELM BARK WEEVIL (Magdalis armicollis Say)

Nebraska. M. H. Swenk (September 14): The reddish elm snout beetle found to be infesting elm trees in Boyd County on August 17.

PIGEON TREMEX (Tremex columba L.)

Nebraska. M. H. Swenk (September 14): Reports of attacking elm and other trees received from Platte and Custer Counties on August 25 and September 7, respectively.

AN APHID (Tuberculatus ulmifolii Monell)

Nebraska. M. H. Swenk (September 14): Complaint from Buffalo County on August 18 of the elm leaf aphid as being very abundant on elm leaves.

WOOLLY ELM APHID (Eriosoma americanum Riley)

Nebraska. M. H. Swenk (September 14): Reports on elm trees in Valley and Saline Counties received on August 25 and 30, respectively.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Connecticut. E. P. Felt (September 26): Young numerous on elm at Stamford.

Washington. E. J. Newcomer (August 28): Very abundant on elm in Spokane, where it has apparently been for some years. (September 14): Very abundant, especially on cork elms, in Selah, Yakima County, where it has been seen for the first time. Apparently it has not been reported previously from this county.

ELM SCURFY SCALE (Chionaspis americana Johns.)

Minnesota. A. G. Ruggles (August): Reported on elm at Minneapolis.

A TERMITE (Reticulitermes tibialis Banks)

Nebraska. M. H. Swenk (September 14): Reported as injuring the roots of a young Chinese elm tree in Fillmore County early in September.

FIR

A GALL MIDGE (Cecidomyia balsamicola Lint.)

North Carolina. B. H. Wilford (September 25): Considerable defoliation by the balsam gall midge reported on several areas of Abies fraseri on Spruce Mountain, Great Smoky Mountains National Park, western North Carolina. Larvae-infested foliage, collected on September 19, brought in for examination.

HICKORY

HICKORY PHYLLOXERA (Phylloxera caryaecaulis Fitch)

New York. E. P. Felt (September 26): Hickory leaf stem galls found somewhat abundantly on hickories at Monroe. This species is common and occasionally very injurious to individual trees.

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Rhode Island. A. E. Stene (September 20): Again quite abundant.

Connecticut. P. Wallace (September 20): Abundant throughout Middlesex and New London Counties, causing considerable damage to black locust. Larvae present and active.

Tennessee. G. M. Bentley (September 15): Many of the black locust trees in the middle and western counties have been highly infested. Injury very noticeable.

LOCUST BORER (Cyrtene robiniae Forst.)

Tennessee. G. M. Bentley (September 15): General infestation on locust trees of various sizes, especially those growing in sunny places. Infestation hardly noticeable in dense, shaded areas, such as woodlands.

Nebraska. M. H. Swenk (September 14): Found to be attacking black locust trees in Jefferson County on August 28.

MAPLE

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Massachusetts. A. F. Burgess (August): Quite abundant throughout Berkshire County.

Michigan. E. I. McDaniel (September 23): Unusually abundant in northeastern Michigan and in the Upper Peninsula, where it defoliated many maple trees.

MAPLE LEAF CUTTER (Paraclemensia acerifoliella Fitch)

Vermont. H. L. Bailey (September 2): More abundant at Londonderry, Windham County, southern Vermont, than I have ever seen it before. Sugar bushes have foliage completely yellowed as the result of attack. Similar but smaller outbreak at East Montpelier, Washington County.

A PYRALID (Tetralopha sp.)

Connecticut. E. P. Felt (September 26): Locally abundant on sugar maples at Ridgefield.

NORWAY MAPLE APHID (Periphyllus lyropictus Kess.)

Ohio. G. A. Runner (September 22): Abundant at Sandusky during August and early in September.

MOUNTAIN ASH

MOUNTAIN ASH SAWFLY (Pristiphora geniculata Htg.)

New Hampshire. G. H. Plumb (September 7): All of the mountain ash seen on the Presidential and Carter Ranges had been completely stripped, presumably by this insect, as many cast skins of sawfly larvae were present on twigs and branches.

OAK

ORANGE-STRIPED OAK WORM (Anisota senatoria A. & S.)

Connecticut. E. P. Felt (September 26): Present in limited numbers at Stamford.

P. Wallace (September 20): Marked defoliation of certain pin and white oaks in Cromwell and Berlin.

OAK BUTTON GALL (Neuroterus umbilicatus Bass.)

Massachusetts. E. P. Felt (September 26): Found in great abundance on white oak in the Cambridge area.

A MITE (Paratetranychus bicolor Banks)

Connecticut. P. Wallace (September 20): Scarlet, black, pin, and white oak attacked in southwestern Connecticut.

PINE

BARK BEETLES (Scolytidae)

General. B. H. Wilford (September 25): The southern pine beetle (Dendroctonus frontalis Zimm.) has caused considerable damage in North Carolina, South Carolina, and Tennessee this season. Shortleaf, pitch, and Virginia scrub



pinus in the mountains and Piedmont districts suffered most; some white pines killed.

Mississippi. C. Lyle (September 25): Ips grandicollis Eich. was received from Holmes County on August 28 with the information that a Cedrus deodara tree was being injured. Specimens of the black turpentine beetle (D. terebrans Oliv.) were collected from pine in Smith County on August 15.

PINE SAWYERS (Monochamus spp.)

Tennessee. G. M. Bentley (September 21): A rather serious outbreak of M. notatus Drury occurred not far from Knoxville, where this insect attacked and killed young white pines.

Mississippi. C. Lyle (September 25): Several adults of M. titillator F. sent in on September 9, with the statement that they emerged from pine lumber shipped from Corinth.

PINE BARK APHID (Pineus strobi Htg.)

Tennessee. G. M. Bentley (September 19): General on white pines.

RED-HEADED PINE SAWFLY (Neodiprion lecontei Fitch)

Connecticut. A. DeCaprio (September 21): Two mature pines were totally stripped and white pine only partially stripped in West Haven.

Mississippi. C. Lyle (September 25): Specimens received on September 18 from Jones County, where they were injuring pine trees.

A GALL APHID (Pineus pinifoliae Fitch)

Minnesota. A. G. Ruggles (August): Found on spruce at Marcel.

POPLAR

POPLAR TENT-MAKER (Ichthyura inclusa Hbn.)

Connecticut. P. Wallace (September 20): Present in large numbers on a few poplars in Old Lyme and Haddam.

TULIPTREE

PROMETHEA MOTH (Callosania promethea Drury)

New York. E. P. Felt (September 26): Larvae sufficiently abundant at Millwood to defoliate partially small tuliptrees and nearby shrubs.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Connecticut. A. DeCaprio (September): Stripping was almost complete on black walnut, butternut, and shagbark hickory at Unionville, Hamden, North Haven, and North Guilford.

Missouri. L. Haseman (September 26): Second generation very light, but an occasional small colony of fifth-instar larvae taken as late as September 15 in central Missouri.

A SAWFLY (Eriocampa juglandis Fitch)

Massachusetts. J. F. Hanson (August 30): Larvae received from Amherst. Collected on black walnut, feeding on the leaves. (Det. by R. A. Cushman.)

WILLOW

POPLAR AND WILLOW BORER (Sternochetus lapathi L.)

Colorado. F. H. Gates (September 1): Specimens of larvae feeding within native willows in Denver sent in. Considerable damage last season. (Det. by L. L. Buchanan.)

Utah. G. F. Knowlton and G. S. Stains (September): Boring in branches of weeping willow at Salt Lake City on May 16. Reported as seriously damaging the tree. (Det. by L. L. Buchanan.) This is an uncommon pest in Utah. Another adult taken from poplar at Salt Lake City in August 1929.

EUROPEAN WILLOW LEAF BEETLE (Plagiodera versicolora Laich.)

Connecticut. F. Wallace (September 20): Common throughout the State, causing browning of foliage evident at this time.

Correction.---A. M. Woodside (September 23): Beetles reported in the Insect Pest Survey Bulletin dated July 1, 1939 (p. 337), as Chrysomela scripta F. and possibly Plagiodera versicolora Laich. have been identified by H. S. Barber as C. interrupta F. and Nodonota puncticollis Say.

ELM SAWFLY (Cimbex americana Leach)

Minnesota. A. G. Ruggles (August): Reported on willow at Hartings.

WILLOW GROVE APHID (Melanoxantharium snithiae Monell)

Minnesota. (August): Reported on willow at Saint Paul and McIntosh.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Nebraska. D. B. Whelan (September 14): On September 7 larvae were eating the leaves of hundreds of pansy plants at Lincoln.

WHITE-LINED SPHINX (Sphinx lineata F.)

Arizona. C. D. Lebert (September 25): Fall migrations of larvae observed on September 18 on the desert areas around Phoenix. As many as 28 larvae per square yard in heavily infested spots. Severe damage to ornamental plants and small garden plots reported from south of Phoenix. Annoying to many residents, as they crawl around over the yards and even over the houses.

SADDLEBACK CATERPILLAR (Sibine stimulea Clem.)

Tennessee. G. M. Bentley (September 20): Packsaddle caterpillar moth unusually prevalent in the State this year. Never observed it before as injuring pyracantha and deutzia. Larger number than usual found upon corn leaves.

FLOWER THRIPS (Frankliniella spp.)

Minnesota. A. G. Ruggles (August): F. tritici Fitch reported on chrysanthemum at Minneapolis.

Utah. G. F. Knowlton (September 11): F. moultoni Hood extremely abundant in blossoms of rabbit brush (Chrysothamnus nauscosus) at Lynndyl and Leamington, Millard County. (Det. by S. F. Bailey.)

WHITEFLIES (Dialeurodes spp.)

Georgia. O. I. Snapp (September 16): Whiteflies are very abundant, as usual at this season of the year, and have caused considerable damage to privet and ornamental shrubbery in the yards of Fort Valley, central Georgia.

Mississippi. C. Lyle (September 25): The citrus whitefly (D. citri Ashm.) reported as abundant on ornamental plants in the southwestern and Meridian districts.

A PLANT BUG (Corizus sidae F.)

Georgia. T. L. Bissell (September 6): Adults and large nymphs thick on cultivated mallow at Experiment.



HAIRY CHINCH BUG (Blissus hirtus Montd.)

Connecticut. J. P. Johnson (September 23): The months of July and August were deficient in rainfall and the dry weather was conducive to an increase of this insect. Infestations reported from Hartford, New Haven, Hamden, West Haven, Stamford, and Greenwich. Much more abundant than usual.

New York. M. D. Leonard (September 28): A fair infestation in progress on a large lawn reported. Earlier in the month the remnant of what must have been a bad infestation was seen by the writer on a lawn in Flushing.

SOFT SCALE (Coccus hesperidum L.)

Maryland. E. N. Cory (August 28): On Pandanus sp. at Bel Air.

A LEAF-CUTTING ANT (Atta texana Buckley)

Texas. R. K. Fletcher (September 12): Severe damage caused to shrubs in Smith County.

COLUMBINE

COLUMBINE LEAF MINER (Phytomyza minuscula Gour.)

New Jersey. M. D. Leonard (September 25): Several plants under observation all season at Ridgewood, still show a fair number of mines in the leaves, and several large plants in another section of town, not previously examined, showed almost no leaf mines.

Tennessee. G. M. Bentley (September 21): Infestation general throughout the State.

CRAPEMYRTLE

CRAPEMYRTLE APHID (Myzocallis kahawaluokalani Kirk.)

Mississippi. C. Lyle (September 25): Heavy infestations reported from the Meridian district.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Michigan. E. I. McDaniel (September 23): Reported from Detroit as infesting euonymus hedge. This pest does not normally winter over in Michigan.

Ohio. E. W. Mendenhall (September 12): Seriously infesting euonymus plants at Springfield.

Tennessee. G. M. Bentley (September 13): Very noticeable increase of infestation on euonymus shrubs generally over the State.

Mississippi. C. Lyle (September 25): Said to be abundant in the Meridian district and in the northeastern part of the State.

#### FERN

##### FERN SCALE (Pinnaspis aspidistrae Sign.)

Mississippi. C. Lyle (September 25): Causing injury to ferns in Harrison County and at State College on September 19.

Oklahoma. F. A. Fenton (September 23): Reported on palm leaves from a greenhouse in Oklahoma City.

#### GLADIOLUS

##### GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Ohio. E. W. Mendenhall (September 15): Found quite generally in Ohio but held to some extent from doing severe damage by control measures.

Utah. G. F. Knowlton (September 18): Moderate to severe injury caused to gladiolus in several gardens at Logan.

##### BULB MITE (Rhizoglyphus hyacinthi Bdv.)

Nebraska. M. H. Swenk (September 14): Specimens of infested gladiolus plants sent in from Douglas County on August 26.

#### HACKBERRY

##### HACKBERRY NIPPLE GALL (Pachypsylla celtidis-mamma Riley)

Minnesota. A. G. Ruggles (August): Found on hackberry at Mankato.

Nebraska. M. H. Swenk (September 14): Complaint received from Valley County on August 25 of this insect on hackberry leaves.

#### HOLLY

##### WALNUT SCALE (Aspidiotus juglans-regiae Comst.)

Oklahoma. F. E. Whitehead (September 2): Scales sent on twigs of deciduous holly from south of Marshall. (Det. by H. Morrison.)

Texas. F. E. Whitehead (September 2): Scale collected on deciduous holly a short distance north of Fort Worth. (Det. by H. Morrison.)

IRIS

IRIS BORER (Macronoctua onusta Grote)

Ohio. E. W. Mendenhall (September 15): Found quite generally in old or long-standing beds of iris in central Ohio. Some damage noted.

OLEANDER

A POLKA-DOT WASP MOTH (Syntomeida epilais jucundissima Dyar)

Florida. H. T. Fernald (September 26): Adults very abundant during the last 2 weeks of August and first week of September on goldenrod blossoms at Orlando.

RHODODENDRON

BROAD-NECKED ROOT BORER (Prionus laticollis Drury)

New York. E. P. Felt (September 26): Grubs found injuring rhododendron roots somewhat seriously at White Plains.

I N S E C T S   A T T A C K I N G   M A N   A N D

D O M E S T I C   A N I M A L S

MAN

MOSQUITOES (Culicinae)

Florida. W. V. King (August 31): Abundant and troublesome in Volusia County throughout August. The highest densities of Aedes taeniorhynchus Wied., as indicated by trap collections at New Smyrna Beach, occurred on August 5 and 23. The lowest trap catches occurred from August 10 to 12, during a windy period accompanying a tropical storm.

J. B. Hull (August 31): The number of mosquitoes causing annoyance in Saint Lucie County was greatly reduced during August. In the first part of the month the salt-marsh breeder, A. taeniorhynchus, was numerous, as well as Psorophora columbiae D. & K. and P. ciliata F. During the latter part of August the fresh-water-breeding P. columbiae and P. ciliata have almost disappeared and the salt-marsh breeders are decidedly less numerous.

Tennessee. G. M. Bentley (September 19): Aedes aegypti L. general over the western and central counties and the lower counties in the eastern part of the State in August and September.

Utah. G. F. Knowlton and F. C. Harmston (September 23): Mosquitoes very annoying in fields west of Perry, in Box Elder County.



Washington. H. H. Stage (August 31): Considerable annoyance from Culex pipiens L. experienced around the southern shores of Lake Washington in Seattle during July and August.

Oregon. H. H. Stage (August 31): In the Portland area C. pipiens and C. tarsalis Coq., Anopheles punctipennis Say, and A. maculipennis Meig. increased in numbers in August, while the numbers of A. vexans Meig. and A. lateralis Meig. decreased materially as the month progressed. A very large population of C. tarsalis has continued at Lebanon in a heavily polluted log pond.

California. F. C. Bishopp (September 14): Spotted-legged mosquitoes, P. columbiae, reported as having been very abundant and annoying in Coachella Valley during the last week. Said to be much worse down the valley toward the Salton Sea. Rather annoying on the streets in Indio. Apparently the first record of the occurrence of this species west of Texas. (Det. by A. Stone.)

EYE GNATS (Hippelates spp.)

North Carolina. J. A. Harris (September 16): Very numerous and annoying to persons working in a sand pit at Aberdeen, getting into ears and eyes.

Georgia. T. Thompson (September 23): Severe outbreak of August very much abated in southern Georgia.

Texas. F. C. Bishopp (September 26): Observed to be rather abundant and annoying in the vicinity of Waco. As many as 25 seen about an individual at once. Stated by K. P. Ewing and R. W. Moreland that these gnats are very annoying in the cottonfields.

SANDFLIES (Culicoides spp.)

Florida. J. B. Hull (August 31): Fewer complaints of sandfly annoyance received from residents of Fort Pierce during August than in any corresponding month since the establishment of the laboratory in that place. It was reported that Vero Beach experienced a heavy infestation of C. melleus Coq. during the last week of August. They were so numerous that people visiting the beach were forced to leave.

CLEAR LAKE GNAT (Chaoborus lacustris Froeborn)

California. A. W. Lindquist (September 8): The emergence of this gnat fluctuated considerably during August but occurred every day. Considerable oviposition occurred during the month. Huge egg drifts, covering thousands of square feet, have concentrated close to shore, causing the water to have a bronze or brown appearance. Four traps operated during this period captured 1,317 pounds of adults.

A THRIPS (Limothrips cerealium Haliday)

Ohio. J. R. Heath (September 15): Swarms appeared in Grover Hill in July, so numerous that they covered the woodwork. (Det. by F. Andre.)

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith (August 31): Adults continued to decline rapidly in numbers on Martha's Vineyard during August, completely disappearing in many localities, while only a few were found in the most heavily infested areas. Immature stages increased in numbers during the month.

PACIFIC COAST TICK (Dermacentor occidentalis Neum.)

Arizona. C. D. Lebert (September 25): Many reports of dog ticks, especially during August and September. The tick most frequently observed is believed to be D. occidentalis.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Maryland. E. N. Cory (August 28): Found in house at Baltimore.

Illinois. P. C. Stone (September 26): Infestation on a dog at Elmwood Park on September 20.

A MITE (Trombidium magnificum Lec.)

Arizona. C. D. Lebert (September 25): Observed in great numbers on the desert north of Phoenix on September 7, following the heavy rains.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. T. Thompson (September 23): Farmers in Thomas, Colquitt, Worth, Mitchell, and Grady Counties, southern Georgia, report outbreak as severe and unabated from last month.

Alabama. J. M. Robinson (September 20): Screwworms and false screwworms (C. macellaria F.) reported as attacking a calf at Selma, on August 29.

Texas. D. C. Parman (August 31): The number of true screwworms was reduced from last year by 50 percent, or more. The highest populations are along the West Nueces River, in the vicinity of Uvalde, and in the Kerrville district. The populations in northern and eastern Texas are very low. Considerably higher population of C. macellaria at the end of August this year than at the same period in 1938.

R. Melvin (September 6): A considerable build-up of C. americana population in the vicinity of Menard is indicated by a number of new range cases and egg masses on experimental animals in August. Three field crews added some 806 new cases to their studies, approximately twice the number of new cases found in July.

STABLEFLY (Stomoxys calcitrans L.)

Missouri. L. Haseman (September 26): For several days between the first and middle of September, stableflies on livestock in central Missouri were extremely abundant and annoying but since September 20 there has been a decided reduction.

Texas. F. C. Bishopp and H. M. Brundrett (September 23): Causing serious annoyance to livestock of all classes on ranches in the canyons north of Uvalde. Cattle bunched and fighting instead of grazing, 50 to 100 flies per animal. Sheep and goats much worried, and horses fighting constantly.

F. C. Bishopp and O. G. Babcock (September 21): At Sonora numerous and causing serious annoyance to animals under experimentation and to sick individuals. As many as 100 flies observed feeding at one time in midafternoon on a single animal.

F. C. Bishopp (September 26): Livestock observed from train from Houston to College Station appear to be annoyed very little by stableflies, and animals observed along the road from College Station to Cleburne were grazing quietly. Some animals had from 5 to 10 flies on them.

HORN FLY (Haematobia irritans L.)

Missouri. L. Haseman (September 26): For several days between the first and middle of September horn flies were extremely annoying to livestock in central Missouri, but since September 20 there has been a decided reduction.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus Nitz.)

Texas. O. G. Babcock (September 25): Just beginning to develop in western Texas and in the Panhandle.

GULF COAST TICK (Amblyomma maculatum Koch)

Mississippi. C. Lyle (September 25): Specimens sent in from Scott County on September 8.

Texas. F. C. Bishopp (September 28): Many complaints of the seriousness of this tick. Inquiry indicated that, owing to the drought, the tick has not been as bad this summer as in the last few years.



HORSE

BOTFLIES (Gasterophilus spp.)

Texas. F. C. Bishopp and D. C. Parman (September 23): At Uvalde G. intestinalis Deg. and G. nasalis L. are very active. Many eggs on animals. This activity apparently began within the last few days, during which time 10 adults of G. intestinalis and 4 of G. nasalis were captured.

F. C. Bishopp and R. W. Wells (September 25): Horses examined for eggs in the vicinity of Waco showed light infestations of G. intestinalis and apparently some eggs of G. nasalis, although satisfactory examinations for the latter species could not be made.

Oregon. F. C. Bishopp and H. H. Stage (September 8): Four horses examined for eggs in the vicinity of Peoria showed a light infestation of G. intestinalis eggs (maximum of about 100) and none of G. nasalis.

California. F. C. Bishopp, A. W. Lindquist, and C. C. Deonier (September 10): Two horses north of Elk Mountain, near Lake Pillsbury, did not have a single bot egg on them. This should be the season of greatest abundance.

BLACK HORSEFLY (Tabanus atratus F.)

Minnesota. A. G. Ruggles (August): Reported at Cambridge and Stanchfield.

POULTRY

FOWL TICK (Argas miniatus Koch)

Arizona. C. D. Lebert (September 25): Observed in one Phoenix residence in September. Poultry had not been on the premises for 3 years but many adults were found beneath the house and under porches. Reported as coming up into the house at night and biting humans.

## HOUSEHOLD AND STORED-PRODUCTS INSECTS

### A TERMITE (Amitermes perplexus Banks)

Arizona. C. D. Lebert (September 25): The desert termite observed at and reported from many residences in the Phoenix area. Several cactus gardens suffered severe injury, with a loss of as high as 20 percent of the plants. Injury to rugs, books, and florist supplies. Numerous records of its constructing earthen tunnels over lawn chairs, grass, fences, and up the trunks of trees, where damage consisted only in scarification of the outer surfaces of the objects. No record of this termite tunneling directly through wood.

### ANTS (Formicidae)

New Hampshire. F. E. Campbell, Jr. (September 22): Formica truncicola integra Nyl. discovered during renovation of a summer house. (Det. by M. R. Smith.)

Mississippi. C. Lyle (September 25): Specimens of the Argentine ant (Iridomyrmex humilis Mayr) collected in Lowndes County, and complaints about infestations received from Carroll, Hinds, Copiah, and Monroe Counties. Control measures for the little black ant, Monomorium minimum Buckl., requested by home owners in Lowndes County and in the southern part of the Delta section. Specimens of Pharaoh's ant (M. pharaonis L.) from Jackson County on August 22 and from Clay County on September 18. Specimens of the fire ant (Solenopsis xyloni McCook) were found at Mississippi State College. Requests for control measures received from Sunflower County and the southern Delta section.

Texas. R. K. Fletcher (September 3): Damage to lawn in Milam County by Pogonomyrmex barbatus F. Smith. Judging by request for control, this ant is causing an increased amount of damage.

### CRICKETS (Gryllidae)

Michigan. E. I. McDaniel (September 23): Complaints concerning crickets entering houses received from several localities. Several species involved. Reported at Lansing, Mesick, Newberry, Ann Arbor, and Saint Joseph.

Arizona. C. D. Lebert (September 25): Field crickets (Gryllus sp.) observed in countless numbers following heavy rains of September 4 and 5. These pests were attracted to brightly lighted business establishments in Phoenix and congregated in such numbers as to become a serious nuisance.

Texas. F. C. Bishopp (September 16): Black crickets (Gryllus sp.) invaded Dallas in great numbers during the last few days. Reports of damage to clothing and household effects.

California. F. C. Bishopp (September 14): In and around Indio G. assimilis F. is now very abundant, annoying, and causing some damage. Observed in large numbers in grassy areas around town, and at night present by hundreds in front of lighted buildings. A considerable number reported as being inside and damaging clothing and table linen. (Det. by A. B. Gurney.)

BROWN-BANDED COCKROACH (Supella supellectilium Serv.)

Mississippi. C. Lyle (September 25): Specimens received on September 23 from Panola County. The only previous report of this species from Mississippi was from Bolivar County in May 1937.

CADELLE (Tenebroides mauritanicus L.)

Tennessee. G. M. Bentley (September 18): A frequent serious pest in Tennessee milling establishments, this has not been reported as serious in any part of the State this year.

Minnesota. A. G. Ruggles (August): Observed attacking stored grains at Saint Paul.

Nebraska. M. H. Swenk (September 14): Found to be infesting grain bins in Saline County on August 30.

CARPET BEETLES (Dermestidae)

Pennsylvania. C. C. Zeliff (September 21): Numerous common black carpet beetles (Anthrenus scrophulariae L.) found in one house at State College and a few Attagenus piceus Oliv. in rugs and on wool clothing. Town heavily infested with these pests.

WHARF BORER (Nacerda melanura L.)

Connecticut. G. H. Plumb (September 20): A large number of adults emerged from a pipe opening in a concrete floor laid over a year ago above an old cellar, which had been filled in with wood debris from the structure torn down.

A SPIDER BEETLE (Ptinus tectus Boield.)

Washington. M. H. Hatch (September 21): Reported in a house in Kirkland, where they were apparently introduced in bedding from a ship.

CORN SAP BEETLE (Carpophilus dimidiatus F.)

Mississippi. R. T. Cotton (September 21): This pest was present in large numbers at practically all of the mills and warehouses visited in Mississippi. It is very much of a nuisance in that it settles in large numbers over bags of milled cereal products. (Det. by E. A. Chapin.)





THE INSECT PEST SURVEY  
BULLETIN

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BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
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DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING





# INSECT PEST SURVEY BULLETIN

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## THE FIELD STATUS OF PARASITES OF THE EUROPEAN CORN BORER IN THE FALL OF 1938

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United States Department of Agriculture

Surveys to determine the current status of parasites of the European corn borer, with special emphasis on localities where imported species had been released, were conducted in the fall of 1938. The section-random-sampling method was used in all surveys, the location of samples being determined by use of polar coordinate or transect designs of a type suitable to the objective sought at each point. The total number of samples taken in the Lake States and Eastern States areas was 424, averaging 88 borers per sample. Thus, a total of 37,309 larvae were collected at the various points surveyed in the 2 areas. A summary of the results of observations in both areas is given in tables 1 and 2.

Table 1.---Parasitization of borers collected at all points surveyed in Lake States area, fall of 1938

[illegible]

Table 1.--Parasitization of borers collected at all points surveyed in Lake States area, fall of 1938--(Cont'd.)

State and county or area	Township	Total Diptera	Chelonus annulipes issued in laboratory	Eulophus viridulus	Labroreychus prismaticus issued in laboratory	Total exotic parasites	Total parasites
		No. %	No. %	No. %	No. %	No. %	No. %
Indiana:							
Stauben	York	4: 0.8	0	0	0	0	4: 0.8
Michigan:							
Monroe	Erie	95: 16.2	0	1: 0.2	0	94: 16.1	96: 16.4
Lake Erie Shore and Detroit River	--	244: 7.3	0	0	0	244: 7.3	244: 7.3
Ohio:							
Erie	Perkins	205: 38.5	0	0	0	204: 38.1	205: 38.3
Lorain	Richland	1: .3	0	0	0	0	1: .3
Lucas	Adams	2: .6	4: 1.1	0	0	5: 1.4	6: 1.7
Do-	Jerusalem	584: 13.4	0	19: .4	0	589: 13.5	603: 13.8
Lake Erie Shore	--	316: 8.9	0	1: .1	1	265: 7.5	318: 9.0
Total	--	1,451: --	4	21	1	1,372: --	1,477: --



Table 2.--Parasites recovered in the Eastern States area, fall of 1938

Survey region	Borers observed:	Inareo- lata	Lydella- grises-	Macrocen- trus	Chelonus- annulipes	Cremastus- flavo- orbitalis:	Bassus- agilis	chus- prismat-	Undeter- mined	Total
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Connecticut:										
East Hartford:	3,466	286	8.3	37:1.1:(1)	-	0	0	0	0	0.1
										343: 9.9
Massachusetts:										
Malden:	3,474	443	12.7	1: T	0	0	0	0	0	0.1
Taunton:	9,731	76	.8	297:3.1:779	8.0	52	0.6	3	T	48: .5: 7
										1:1,275:13.1
New Jersey:										
Atlantic:	735	5	.7	1:0.1:(1)	-	0	0	0	0	0
Burlington:	1,027	0	0	(1): -	3	.3	1	.1	(1)	-
Virginia:										
Lee:	1,879	0	0	179:9.5:(1)	-	0	0	0	0	0
										2: 181: 9.6
Total:	20,312	810	--	515: --:782	--	53	--	3	--	11
										23: --:2,266: --

1/ No release of this species at points indicated.

Status of Parasites as Determined by the 1938 Surveys

Lydella stabulans var. grisea R. D.--In the Lake States area special surveys were conducted to determine the distribution of this tachinid in the vicinity of marshland near the bays, inlets, and shorelines of Lake Erie and the Detroit River. These observations were intended to supplement information on the dispersion of Lydella grisea as obtained from surveys of similar type in previous years and to furnish possible data of value in interpreting the limitations on its distribution. The tachinid was found to be present in a band several miles wide near all marshland from the Huron River east of Sandusky, Ohio, to the outskirts of Detroit, Mich., a distance of over 130 miles. Within this area are several points at which L. grisea has been released. A fairly uniform decrease in population density was noted as the distance from the release points increased, indicating that dispersion was still occurring. At 3 test points near Lake Erie the increase in population noted from surveys of similar type, made in several previous years, has continued. At Jerusalem Township, Lucas County, one of the older test points, an increase was noted in each of the 5 rings of the polar coordinate sampling design utilized at this point. Parasitizations, chiefly by L. grisea, of over 80 percent were obtained and among borers from 11 sections nearest the marsh the average was over 40 percent. The distribution of the species in Jerusalem Township in the fall of 1938 is shown on map 1. The annual fall parasitization by L. grisea for the last 7 years at this colony is given in table 3.

Table 3.--Annual fall parasitization by Lydella grisea about the Jerusalem Township, Ohio, release point

Year	Parasitization within radius of release	
	3 1/2 miles	7 1/2 miles
	Percent	Percent
1932-----	0.3	--
1933-----	2.8	--
1934-----	6.3	--
1935-----	7.6	4.4
1936-----	10.0	7.0
1937-----	17.1	9.6
1938-----	21.3	11.4

Although Lydella grisea has been present in Jerusalem Township for 9 years, it is not yet evident that this species has attained environmental equilibrium. In Perkins Township, Erie Co., Ohio, another of the older release points, the parasitization by L. grisea increased about 350 percent in 1938 over that of 1937. The parasitization at this point in the immediate vicinity of the colony site for the last 7 years is given in table 4.

Table 4.--Annual fall parasitization by *Lydella grisescens* about the Perkins Township, Ohio, release point

Year	Parasitization within 1 1/2 mile radius of colony site
	Percent
1932 -----	3.8
1933 -----	15.7
1934 -----	7.3
1935 -----	.8
1936 -----	.8
1937 -----	8.4
1938 -----	38.1

In the Eastern States area *Lydella grisescens* was recovered in all surveys made at points where the parasite had been released. It was apparently of no importance at the Malden, Mass., or Atlantic, N. J., points. At Hartford, Conn. little increase in the percentage of parasitization was noted but there was a considerable increase in the area from which the parasite was recoverable. A dispersion of this species more uniform than in previous years was found in the Taunton, Mass., district, where the average parasitization had increased from 1 percent in 1937 to 2.5 percent in 1938. Map 2 shows the distribution at this point.

At one release point in Accomac County, on the Eastern Shore of Virginia not only was there a decided increase in percentage of borers parasitized (probably partly due to a greatly decreased host population), but an extensive dispersion of the parasite took place. Although the territory surveyed in Virginia was increased from approximately 38 square miles in the fall of 1937 to over 70 square miles in 1938, the number of *L. grisescens* obtained from hosts collected near the boundary of the surveyed region, and the fact that there was a greater proportion of parasites in borers from the periphery of the survey than in those from the central portion, indicated that the parasite had dispersed beyond the limits of the district surveyed. The apparently favorable reaction of *L. grisescens* to the environment of this district may be due to the extensive area of marshland found on the Eastern Shore of Virginia.

*Inareolata punctoria* Roman.--No specimens of this ichneumonid were recovered in the collections made in the Lake States area in the fall of 1938. In the Eastern States, however, the parasite was recovered in numbers from the vicinity of the Malden and Taunton, Mass., and Hartford, Conn., release points. The two distinct areas in which *I. punctoria* is found near the Taunton, Mass., point, representing spread from two colony sites, were found to have moved close together in 1938. (See map 2.) The greatest increase in parasitization by *I. punctoria* occurred in the East Hartford, Conn., district, where the area in which it was found was extended by 273 percent and the percentage of parasitization increased more than 100 percent in 1938 over 1937. Map 3 shows the territory occupied by this parasite as determined by the fall surveys of 1936, 1937, and 1938.



Macrocentrus gifuensis Ashm.--The polyembryonic larval parasite Macrocentrus gifuensis increased greatly in the Taunton, Mass., district during the 1938 season. The average parasitization by this species for the entire area covered in this district increased from 1 percent in the fall of 1937 to 8 percent in the fall of 1938. From the central 500-square-mile portion of the area, recorded parasitization increased from 1.9 percent in the fall of 1937 to 3.9 percent on the first generation of the host in the summer of 1938, and continued to increase to average 10.8 percent on the second generation in the fall of 1938. Forty-seven of the 100 collections made in the Taunton area in the fall of 1938 produced M. gifuensis and, in the 47 collections, 15 showed a parasitization by this species of over 20 percent. The maximum parasitization by M. gifuensis for any collection was 56.3 percent, as compared with a maximum of 33 percent in a collection in the 1937 fall survey. The district of highest concentration was that territory within 10 miles of the release point at East Bridgewater, Mass. A total of 779 cocoon masses were produced and 15,055 adults obtained. In the Taunton district the area in which M. gifuensis was found increased from 278 square miles in the fall of 1937 to approximately 715 square miles in the fall of 1938. Map 2 shows the distribution of M. gifuensis as determined by the survey at the close of 1938. In view of the remarkable increase in numbers and distribution of M. gifuensis, it should be mentioned that as late as the fall of 1935 the parasite was not recovered in collections taken specifically to obtain it. Therefore, while present in the field, it must have been very scarce. The last release of this parasite in the area it now occupies was made in 1932.

Chelonus annulipes Wesm.--Initial establishment of this egg-larval parasite, following current releases, was noted in 1938 in Adams Township, Lucas County, Ohio, and at Burlington, N. J. At Taunton, Mass., the parasite was still on a maintenance basis but a decrease in percentage of parasitization was shown. Although the number of sections from which this braconid was recovered was not increased in 1938 over that of 1937, the area from which the species was taken was somewhat extended. It is estimated that C. annulipes is now present over an area of 292 square miles in southeastern Massachusetts, an increase since 1937 in the known occupied area of 142 square miles having been established as a result of the fall survey of 1938.

Cremastus flavoorbitalis (Cen.).--The larval parasite C. flavoorbitalis was recovered in 1938 only from the vicinity of Taunton, Mass., where it has been on a maintenance basis in small numbers for at least 5 years.

Eulophus viridulus Thoms.--In the 1938 fall surveys this octophagous chalcid parasite was found on a maintenance basis for the first time in the United States. It was first noted by C. A. Crooks while he was examining larvae in weeds in Jerusalem Township, Lucas County, Ohio, in the fall of 1938. During the fall survey of that year the parasite was taken in collections of borers in corn from 12 of the 51 sections sampled. This condition is in accordance with observations in Europe where a definite migration from borers in Artenisia, in

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1/ Nine thousand adults of Macrocentrus gifuensis were shipped to the Dominion Parasite Laboratory at Belleville, Ontario, Canada, for experimental use and 1,100 adults were consigned to the Division of Foreign Parasite Introduction and subsequently shipped to Puerto Rico for testing on insect pests of that island.

the case of the summer generation, to borers in corn for the winter generation, has been noted. The last release of E. viridulus at the Jerusalem release point was made in 1932, thus showing maintenance for 6 years. The greatest dispersal from the Jerusalem colony site was about 5 miles. E. viridulus was also recovered at Erie Township, Monroe Co., Mich., and at Danbury, Ohio. The nearest release to the latter recovery point was about 8 miles, 4 miles of which were across the water of Sandusky Bay. E. viridulus was also found attacking two native borers, Pyrausta ainsliei Heinrich and Pyrausta penitalis Grote. This is the first record of an exotic parasite of the European corn borer attacking a native host.

Native parasites.--In the Eastern States area the following native parasites were recovered: Bassus agilis Cresson, Labrorychus prismaticus Nort., Macrocentrus robustus Mues., and Amblyteles brevicinctus Say. From borers collected in the Lake States area there were obtained Zenillia caesar Ald., Panzeria penitalis Coq., and Labrorychus prismaticus Nort. In no case was the parasitization by native species important.

#### Summary

Surveys were conducted at the close of the 1938 season to determine the status of exotic and native parasites of the European corn borer in the vicinity of liberation points in the United States.

The tachinid, Lydella stabulans var. grisescens was found in greatest abundance near marshland along the shores of Lake Erie and the Detroit River. In this area parasitizations as high as 50 percent, chiefly by L. grisescens, were observed and in restricted localities parasitization by this species was higher than that by all other species combined in any other area.

An exceptional increase in the area from which parasites were recovered and in the percentage of parasitization was noted at the release point in Accomac County, Va., where marshland thought to be favorable for the increase of this fly is prevalent.

Macrocentrus gifuensis made a remarkable increase in the vicinity of release points in southeastern New England, after failing to appear in host collections for several years following liberation.

Inareolata punctoria was the most generally distributed and abundant parasite at the eastern survey points.

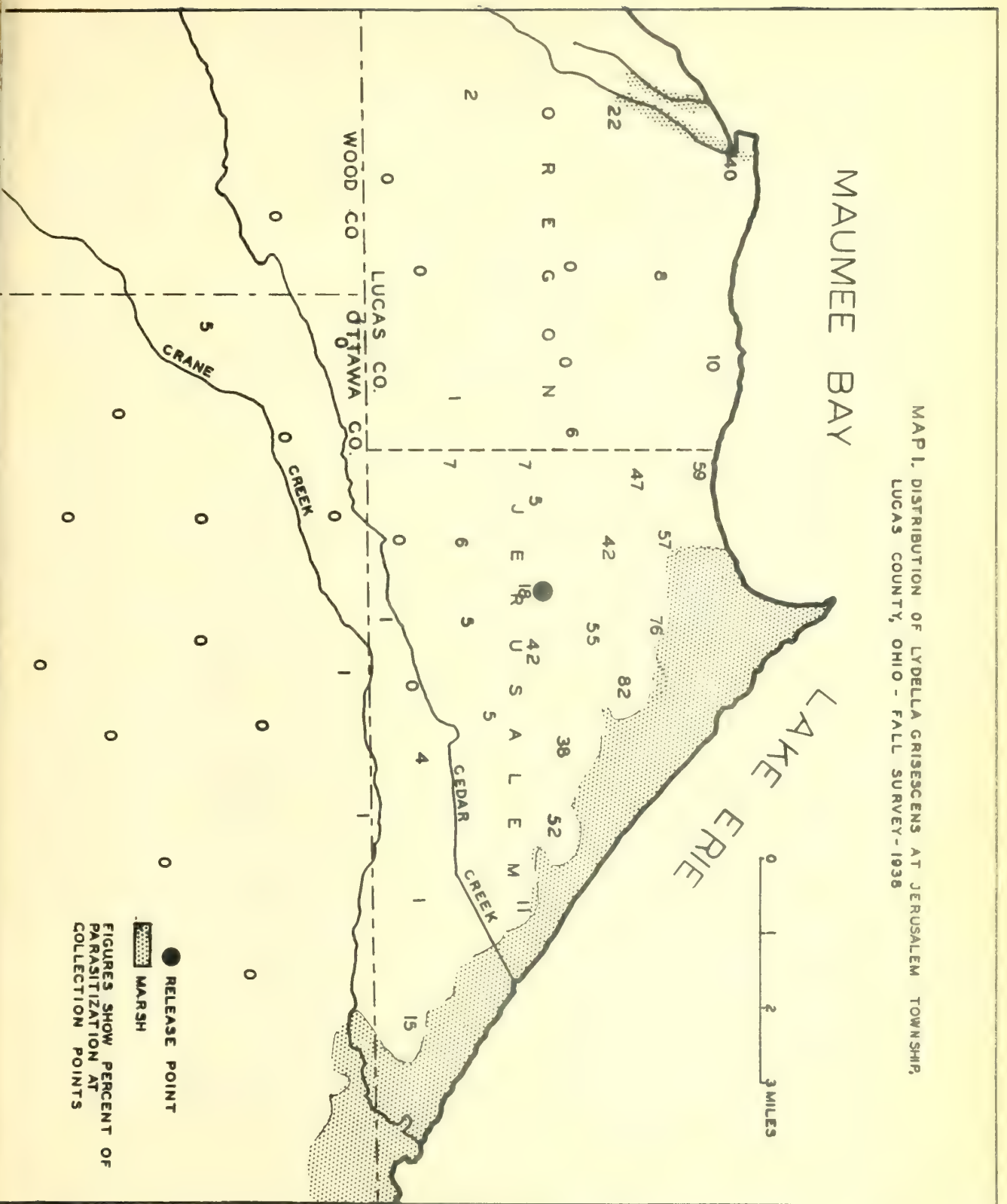
Chelonus annulipes had increased its range in the Taunton, Mass., area.

Eulophus viridulus was recovered in Ohio on a maintenance basis for the first time since its introduction in 1931 and 1932. Two native borers, Pyrausta ainsliei and Pyrausta penitalis, were found parasitized by this species.

Five species of native parasites were found but in no case did the percentage of parasitization reach important proportions.

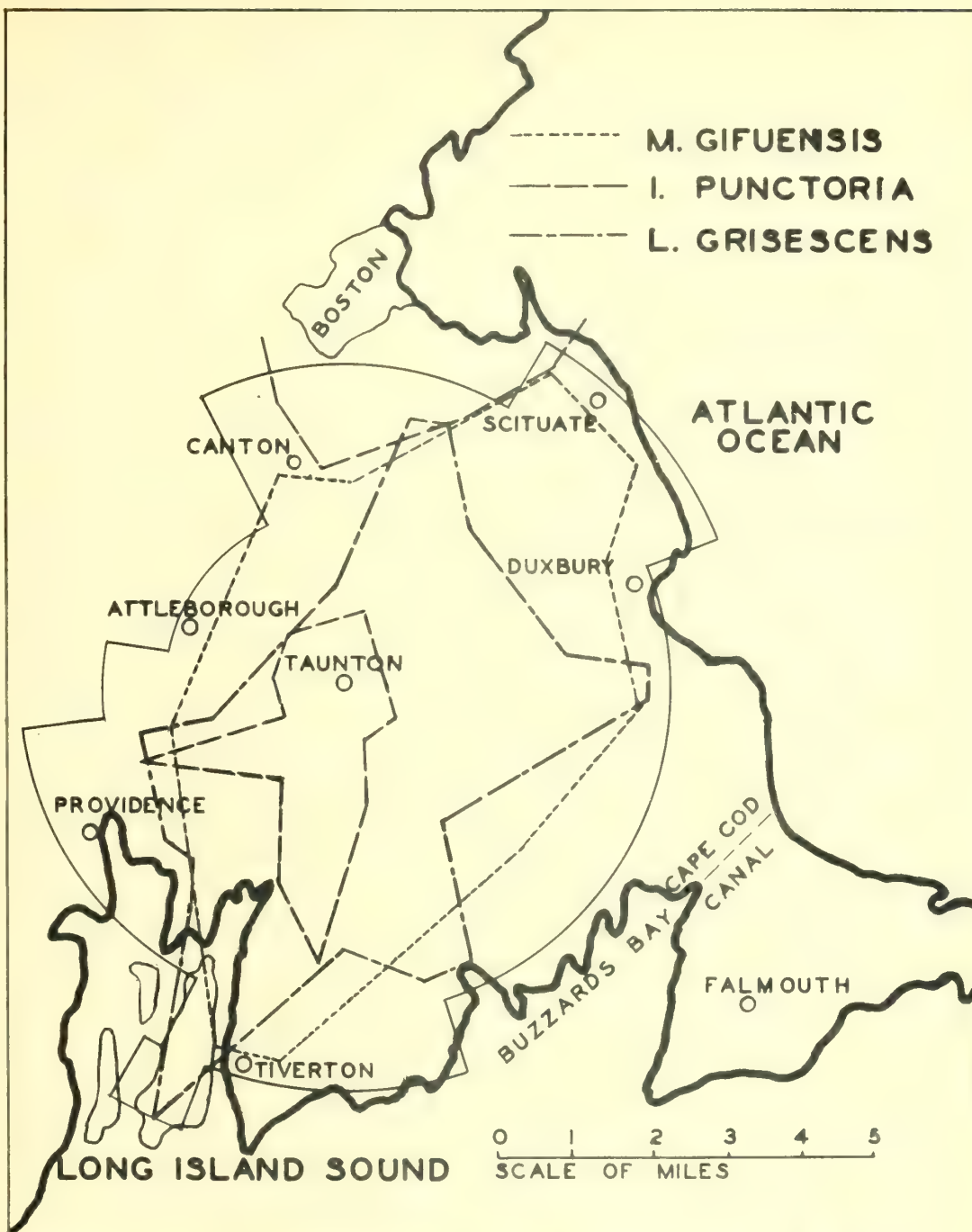


MAP I. DISTRIBUTION OF LYDELLA GRISESCENS AT JERUSALEM TOWNSHIP,  
LUCAS COUNTY, OHIO - FALL SURVEY - 1938





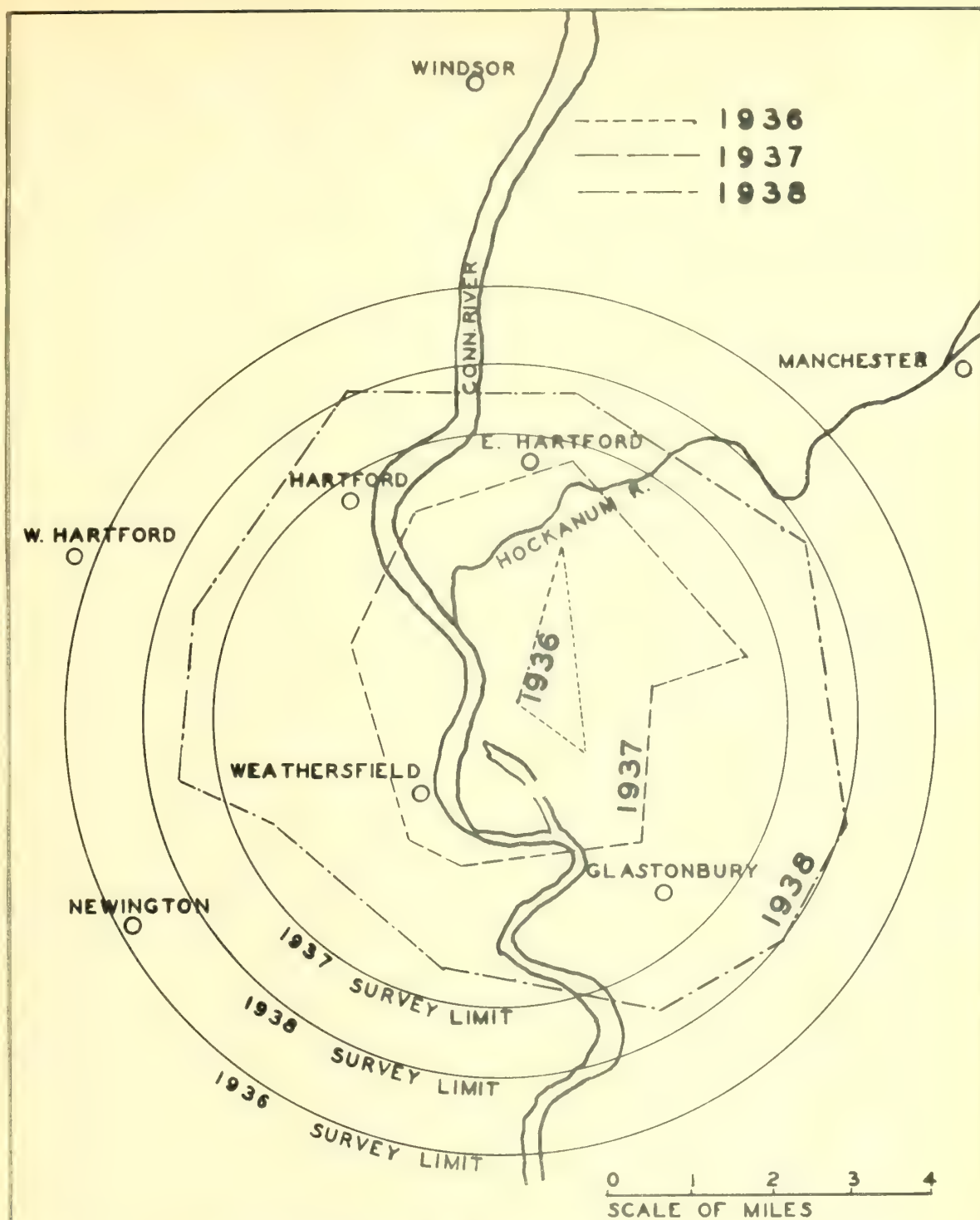




MAP 2. DISTRIBUTION OF PARASITES IN THE  
VICINITY OF TAUNTON, MASSACHUSETTS  
FALL SURVEY-1938







MAP 3 DISTRIBUTION OF *INAREOLATA PUNCTORIA*  
AT EAST HARTFORD, CONNECTICUT



AGRICULTURAL RESEARCH  
**THE INSECT PEST SURVEY**  
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**AGENCIES COOPERATING**





THE MORE IMPORTANT RECORDS FOR OCTOBER

Fuller's rose beetle was reported damaging kale and a number of broad-leaved evergreens in the Norfolk section of Virginia.

The fall armyworm was generally prevalent and doing considerable damage along the Atlantic seaboard from Norfolk to southern Virginia and around the Gulf from Alabama to Louisiana.

The velvetbean caterpillar seriously damaged cowpeas and soybeans from North Carolina to Florida and westward to Mississippi.

Large numbers of chinch bugs are entering hibernation, from Indiana to Iowa and southwestward through Missouri to Kansas.

European corn borer was generally less prevalent than last year in New York, except in the upper Hudson River Valley. Reports were received from northeastern North Carolina and two specimens were taken in Cook County, Ill.

The clover head weevil (Tychius picirostris F.), first found in Puget Sound region of Washington State in 1929, was found in considerable numbers in the four northern counties of the Willamette Valley, Oreg., this year. It was also found in Deschutes County, east of the Cascades.

Comstock's mealybug (Pseudococcus comstocki Kuw.) has appeared in injurious numbers in several localities in the Shenandoah-Cumberland area, a particularly heavy infestation occurring near Crozet, Va.

Corn ear worm did considerable damage late in September and early in October in the trucking section from Maryland to Georgia and Mississippi, being particularly destructive to cruciferous plants. Lettuce and tomatoes were damaged from moderately to severely in California and Utah.

The potato tuber worm was recorded for the first time from Nebraska where it seriously injured about 125 bushels of potatoes in Cass County.

The Mexican bean beetle was unusually troublesome late in the season from South Carolina to Missouri and southward to the Gulf.

The banded cucumber beetle was from moderately to seriously abundant over the southern part of the Gulf States.

A very heavy outbreak of the Hawaiian beet webworm was reported from the Norfolk area of Virginia. Larvae were damaging spinach and beets.

Fall webworms were unusually severe in New England and along the Atlantic seaboard from Virginia to Florida. In the East Central States, Indiana and Missouri reported these insects in large numbers. Heavy infestations were also reported from Mississippi.

A heavy outbreak of walkingsticks in forest lands, particularly in locust trees, was reported from Virginia and Tennessee.

The bronzed birch borer was seriously damaging yellow birch in the northern New England States.

The European spruce sawfly still presents a serious problem in the northern New England States.



G E N E R A L   F E E D E R S

GRASSHOPPERS (Acrididae)

Tennessee. G. M. Bentley (October 23): Causing a 25-percent defoliation on soybeans at Dresden, Weakley County, on October 6.

Injuring clover at Greenfield, Weakley County, on October 7, with an average of 10-percent defoliation, and 100 percent on a strip 20 feet wide on the outer edge of the field. Swarming in hordes into the town of Waynesboro, Wayne County, on October 12.

Illinois. W. P. Flint (October 25): Fall survey indicates that eggs are much less abundant than at any time in the last 5 years. Predators have been concentrating on the egg masses. In one area 54 percent of the eggs had already been destroyed.

Michigan. E. I. McDaniel (September 28): Melanoplus mexicanus Sauss. was found laying eggs in Antrim County as late as September 21.

Missouri. L. Haseman (October 23): Surveys under way throughout Missouri indicate numerous eggs throughout part of southern Missouri, where hoppers were most abundant during the summer and fall. Some females of both the lesser migratory hopper and the differential (M. differentialis Thos.) had not yet deposited their eggs at Columbia by the middle of October. Throughout most of the northern two-thirds of the State indications are that there will be only a light carry-over of eggs.

Oklahoma. C. F. Stiles (October 23): The second brood of M. mexicanus has evidently deposited a large number of eggs throughout the northern halves of Texas and Cimarron Counties, in the Oklahoma Panhandle. The area where the eggs are found is the principal wheat-growing section of these counties.

MORMON CRICKET (Anabrus simplex Hald.)

Utah. C. J. Sorenson (October 23): Infestations occurred in menacing numbers in Juab, Millard, Sanpete, and Tooele Counties. Damage to farm crops did not exceed \$2,500 during 1939, although an aggregate of 28,500 acres of crops was protected from damage. Small infestations occurred in Iron, San Juan, and Utah Counties. Total area infested during 1939 is estimated at 312,000 acres, as compared with 500,000 acres in 1937.

JAPANESE BEETLE (Popillia japonica Newm.)

Vermont. H. L. Bailey (October 26): Traps operated in Burlington, northwestern Vermont, showed increase in number of beetles over previous seasons. Burlington is an isolated colony, the nearest

known infestation being Rutland, 70 miles south. Attacks by beetles on vines and plants reported in August from White River Junction, Windsor County, east-central Vermont, and Brattleboro, Windham County, southeastern Vermont.

Connecticut. J. P. Johnson (October 23): Injury to turf much greater than in 1938. In Hartford over 100 acres of turf in the parks has been seriously injured and more than 100 acres more are infested. Turf also badly infested in New Haven and in certain of the Bridgeport parks.

Rhode Island. M. D. Leonard (October 12): A few beetles were still feeding on marigolds at Providence.

A SCARABAEID (Ochrosidia borealis Arrow)

Maryland. F. F. Smith (September 18): Numerous larvae destroying roots of grass in Silver Spring. Abundant in localized areas in 1 lawn, over 200 being taken from beneath sod in a 2-square-yard area. Grass killed in such areas. Similar spotting noted in several lawns. (Det. tentatively as the above by W. H. Anderson.)

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Virginia. H. G. Walker and L. D. Anderson (October 24): Observed rather seriously infesting a small area of a kale field at Norfolk. Several requests received for information on control on gardenias in Norfolk.

C. R. Willey and F. R. Freund (October): Increasing in Virginia. Found attacking azalea, rhododendron, and gardenia, and specimens, which had been feeding on hydrangea and ivy, were brought in on September 29.

WHITE GRUBS (Phyllophaga spp.)

Tennessee. G. M. Bentley (October 23): Two reports of heavy soil infestations, one from Chattanooga, Hamilton County, on October 7 and the other from Nashville, Davidson County, on October 12.

GREEN JUNE BEETLE (Cotinis nitida L.)

New Jersey. C. H. Hadley (October 24): Outbreak observed at Haddonfield early in September. Many thousands of exit holes and larvae covering a large area of turf.

BUMBLE FLOWER BEETLES (Euphoria spp.)

Michigan. E. I. McDaniel (September 28): Report received of unusual abundance of E. inda L. in Benzie and Osceola Counties.

Oregon. R. L. Post (September 25): Ten specimens of E. rufobrunnea Csy. collected at Condon and reported as congregating on an ear of corn and damaging it. (Det. by M. H. Hatch.)

#### WIPEWORMS (Elateridae)

Connecticut. R. L. Beard (October 24): Damage to potatoes generally less severe in 1939 than in 1938, the earlier varieties showing greater injury than the late.

North Dakota. J. A. Munro (October 21): A few fields in the lighter types of soil in the northeastern potato-growing section of the State show from light to heavy injury of the tubers. In general, injury to potatoes appears to be much less than in 1938. The prairie grain wireworm (Ludius acreipennis Kby.) is the pre-dominating species.

California. R. E. Campbell (October 6): Tomato field in Los Angeles County just examined, in which Limoni californicus Mann. was boring into tomatoes in contact with the soil. Damage noticed shortly after recent rains had thoroughly moistened the soil. Many tomatoes contained several, one having 14. Similar damage reported from other fields.

#### COFFEE-BEAN WEEVIL (Araecerus fasciculatus Deg.)

Louisiana. O. T. Deen (October 4): Larvae taken from crowns and vines of Jacquemontia tamnifolia at Sunset. Languria sp. was also present. Apparently no injury to plant. Specimens were tunneling in the plants in a similar manner to the sweetpotato weevil. (Det. by W. H. Anderson.)

#### CUTWORMS (Noctuidae)

Florida. J. R. Watson (October 21): The semi-tropical armyworm (Prodenia oridania Cram.) and the larvae of Mocis repanda F., in particular, have been very injurious to lawn grass during the last month.

Missouri. L. Haseman (October 23): On the nights of October 18-20 at Columbia there was a rather heavy flight of armyworm moths coming to lights and to decaying fruit.

Utah. C. J. Sorenson (October 23): Moths of the pale western cutworm (Agrotis orthogonia Morr.) appeared in greatly reduced numbers in Utah County, as compared with the last 4 seasons. Active from September 9 to October 15, feeding on flowers of Chrysothamnus sp. and ovipositing.



FALL ARMYWORM (Laphygma frugiperda A. & S.)

New York. L. A. Carruth (October 25): Very abundant and destructive to sweet corn on Long Island from early in August until the end of the season. Serious infestations observed in the Hudson Valley as far north as Saratoga County late in September. Heavy infestation seen in Yates County, in the Finger Lakes district, on October 9. Reference made to an infestation of corn in Schenectady County by the true armyworm (Cirphis unipuncta Haw.) on page 437 of the Insect Pest Survey Bulletin dated October 1, 1939. Late in September the writer saw the gentleman who collected the specimens and examined the field where they were taken. At that time larvae of the fall armyworm were abundant. It appears that the infestation reported earlier was caused by the fall armyworm and not by the true armyworm. The writer has personally examined fields of sweet corn in practically all counties from eastern Long Island to the upper Hudson Valley, and no larvae of C. unipuncta were observed, although larvae of L. frugiperda occurred generally, particularly late in September.

Maryland. E. N. Cory (September 23): Reported as attacking corn at Brooklandville, Baltimore County.

Virginia. C. R. Willey and F. R. Freund (October): Very abundant and doing a great deal of damage to late corn in King George, Richmond, Westmoreland, Northumberland, and Lancaster Counties during the week following September 10. Found on October 6 injuring gladioli at Driver, Nansemond County.

H. G. Walker and L. D. Anderson (October 24): Considerable damage in spinach and peafields at Norfolk during the last 6 weeks, besides having been very destructive to late-planted corn.

W. J. Schoeno (October 25): A number of reports of severe injury received from counties throughout the central part of the State and as far west as Wytheville. Particularly injurious to late-planted corn.

Alabama. J. M. Robinson (October 13): Reported as attacking peanuts at Clayton on September 26.

Mississippi. C. Lyle (October 25): One female of Chelonus texanus Cress. taken in the act of ovipositing in eggs of L. frugiperda on a magnolia leaf in Lowndes County on October 12.

Louisiana. C. O. Eddy (October 25): The grassworm has killed late fall corn.

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

North Carolina. L. W. Brannon (September 29): Larvae causing severe damage to leaves of soybeans at Elizabeth City, Pasquotank County,

on September 29. (Det. by C. Heinrich.)

South Carolina. J. G. Watts (September): More abundant in Barnwell County than in recent years. Extensive defoliation of soybeans, velvetbeans, and peanuts. Control measures necessitated in many instances.

Georgia. H. I. Borders (October 6): Some damage was observed in fall plantings of cucumbers at Tifton in fields adjacent to plantings of legumes.

Florida. J. R. Watson (October 21): Near Archer, Alachua County, there has been a severe infestation on cowpeas. The infestation spread from a peanut field and did much damage. Infestation brought under control by a fungus disease.

Alabama. J. M. Robinson (October 13): Reported on September 30 as attacking peanuts at Ariton, Dale County, and Auburn, Lee County.

Mississippi. C. Lyle (October 25): Collected on soybeans at State College on September 25, and in Jefferson Davis County on September 29.

MONARCH BUTTERFLY (Danaus menippe Hbn.)

Kentucky. W. A. Price (October 25): Observed in large numbers at Lexington from September 25 to 27. They appeared to be moving in a southeasterly direction.

A PLANT BUG (Thyanta custator F.)

Nebraska. M. H. Swenk (October 17): Heavy flight reported as having taken place in York County on the night of October 7.

A TREE HOPPER (Enchenopa binotata Say)

Minnesota. H. Milliron (October 20): Reported at Northfield.

SAY'S STINKBUG (Chlorochroa sayi Stal)

Utah. G. F. Knowlton (October 23): Occasional adults found recently under Russian-thistle and amaranthus weeds in Salt Lake, Cache, and Davis Counties. Probably seeking shelter for hibernation.

C. J. Sorenson (October 23): Observed in moderate numbers during September in Millard County, feeding on young alfalfa seed.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER GRAINS

HESSIAN FLY (Phytophaga destructor Say)

Indiana. J. J. Davis (October 5): The long, dry spell has prevented emergence; however, despite the dry conditions, considerable wheat has been sowed. A high mortality of the flaxseeds, probably owing to the excessive dryness, is reported.

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (October 21): By October 6 only a few second-brood bugs, either fifth-instar nymphs, or adults, remained in corn in the vicinity of La Fayette. By October 16 practically none could be found. There was a progressive increase of the numbers present in a series of comparable bunchgrass samples examined at 10-day intervals. Migration screens set near bunchgrass showed that real migrations started about the middle of September and continued until about October 10, with peaks around September 15-16, September 26-30, and October 5-9.

Illinois. W. P. Flint (October 25): Survey just started. From the data gathered thus far, very large numbers are found to be in hibernating quarters, probably the greatest number since the fall of 1933.

Iowa. H. E. Jaques (October 23): Very abundant in many places throughout southern Iowa. In Henry County it is apparent that some corn yields have been appreciably reduced, and their large numbers constitute a serious threat for the next season.

Missouri. L. Haseman (October 23): Preliminary fall surveys indicate that, although chinch bug is scattered throughout the various counties, there is going to be a heavy carry-over in scattered localities throughout most of the State. Scarcity of rain since August has proved ideal for this pest. Last week bugs were feeding in green grass and were not found in large numbers in clump grasses.

Nebraska. M. H. Swenk (October 17): Heavy flights of adults seeking hibernation quarters were noted in southeastern counties during the first half of October.

Kansas. H. R. Bryson (October 24): Probably the outstanding insect feature of the month has been the flights of enormous numbers of adults. The long period of dry weather, accompanied by high temperatures, has stimulated flight. Large numbers found in



and around bunch grasses.

FALSE WIREWORMS (Eleodes spp.)

Kansas. H. F. Bryson (October 24): Favored by dry-soil conditions which have prevailed over the greater part of the plains Wheat Belt. Although many losses in the area are attributed to dry weather, it is known that false wireworms are responsible for considerable damage to seed wheat.

WHEAT MIDGE (Thecodiplosis mosellana Gehin)

Washington. M. M. Recher (July): A survey from July 24 to 27 of the present area infested in western Washington showed only a minor extension of the area infested in 1936. This was from Puyallup to Orting, about 10 miles in a previously infested valley in Pierce County. This is the known southern limit to date. None found on Fidalgo and Whidbey Islands, although the full length of the nearby mainland is known to be infested.

CORN

CORN EAR WORM (Heliothis armigera Hbn.)

Vermont. H. L. Bailey (October 26): Many larvae found in popcorn ears being harvested on October 4 at Guildhall, Essex County, northeastern Vermont.

New York. L. A. Carruth (October 25): Slightly less abundant than usual on Long Island in 1939, although late in September serious injury to sweet corn ears was common. Relatively light infestations observed late in September and early in October in Ulster, Columbia, Albany, and Yates Counties, eastern New York. Much of the injury attributed to this pest actually caused by the fall armyworm (L. frugiperda) which was unusually abundant.

Minnesota. A. G. Ruggles (October 20): Very abundant; last crop of sweet corn 100-percent infested.

Missouri. L. Haseman (October 23): A heavy flight of moths appeared at Columbia from October 18-20, and some of the females were heavily loaded with what appeared to be mature eggs. Late corn still showed larval feeding in the ears at this time, although killing frosts have eliminated most vegetation on which larvae might attempt to feed.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

New York. L. A. Carruth (October 25): Late infestations of the second summer generation lighter than in 1938 in eastern New York. Decrease in abundance apparently owing principally to

the unusually dry weather. Despite the lower average of infestations, a number of individual fields were observed which showed serious infestations, particularly on western Long Island and in the Hudson Valley, in Ulster, Columbia, and Albany Counties.

North Carolina. D. L. Wray and J. A. Harris (October 15): Slight infestation found in Currituck, Camden, and Pasquotank Counties, northeastern North Carolina. Previously reported this year on Knott Island, but also found in the above counties, being heavier near the coast line. (Det. by C. S. Brimley; other specimens from same counties det. by C. Heinrich.)

Illinois. W. A. Baker (October 13): Two specimens taken in corn at Des Plaines, Cook County, on October 1. (Det. by C. Heinrich.)

#### ALFALFA

##### ALFALFA WEEVIL (*Hypèra postica* Gyll.)

Utah. C. J. Sorenson (October 23): Increase in damage in Cache, Carbon, Duchesne, Emery, Millard, and Utah Counties during the 1939 season.

California. A. E. Michelbacher (October 23): Survey in the alfalfa fields of the infested part of the San Joaquin Valley on October 16. Average number of adults collected per 100 sweeps for the different fields ranged from 0 to 108, while the number of larvae ranged from 0 to 22. On the same date in the region adjacent to the San Francisco Bay, the number of adults collected per 100 sweeps ranged from 0 to 1, while no larvae were taken.

#### PLANT BUGS (*Lygus* spp.)

Utah. C. J. Sorenson (October 23): *L. elisus* Van D. and *L. elisus hesperus* Knight moderately abundant and slightly reduced in numbers, in comparison with recent years in all alfalfa fields, but inflicting serious damage in alfalfa-seed fields. Infestations very heavy during 1939 in some districts and fields. Observed early in October in unusually large numbers on ornamental flowers and on various species of *Chrysothamnus* and *Artemisia*, which were in bloom.

#### CLOVER

##### A CLOVER-HEAD WEEVIL (*Tychius picirostris* F.)

Oregon. H. M. Recher (July): Swept in July from roadside alsike clover in Columbia, Clatsop, Clackamas, and Washington Counties, Oreg. One weevil swept on July 15 in 600 sweeps of volunteer

hairy vetch and alsike clover in a field near Sisters, Deschutes County, Oreg. (Det. by L. L. Buchanan.) First found in the Puget Sound area of Washington in 1929.

GREEN CLOVER WORM (Plathypena scabra F.)

Mississippi. C. Lyle (October 25): Found on soybeans at State College on September 25.

A NOCTUID (Polamia latipes Guen.)

Georgia. T. L. Bissell (October 4): Two moths emerged on September 29 from pupae on soybean leaves at Experiment, central Georgia. Three were collected and reared from September 1 to October 29, 1935, from larvae on grass. One moth obtained on October 27, 1936, from pupa on weed. (Specimens in 1935 det. by J. F. G. Clarke.)

GRASS

TERMITES (Isoptera)

Texas. P. T. Rihard (October 14): The desert termite is becoming an economic pest of importance in some of the west-central counties. Especially noticeable in the drought-stricken counties. In some places 25 percent of the grass is covered by their tunnels.



FRUIT INSECTS

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

North Carolina. D. L. Wray (September 20): Considerable damage to apple trees observed in Catawba County.

Mississippi. C. Lyle (October 25): Reports of injury to peach trees received from Sunflower and Warren Counties late in September.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Mississippi. C. Lyle (October 25): A larva received from Washington County on October 23, with information that this species was killing young pecan trees in one grove.

SAN JOSE SCALE (Aspidiotus perniciosus Const.)

Minnesota. A. G. Ruggles (October 20): Reported from Rose Township.

Mississippi. C. Lyle (October 25): Heavy infestations reported from the Meridian area and from the southeastern section, where one young peach orchard has been practically destroyed. Moderately abundant in the Jackson territory.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Virginia. A. M. Woodside (October 20): No third brood in Augusta County, according to insectary and bait-pail records.

Minnesota. A. G. Ruggles (October 20): Very abundant where trees were not treated properly.

Missouri. L. Haseman (October 23): Extremely heavy pick-up of third-brood larvae reported. Largely out of the fruit and into their winter cocoons. Last moths taken in bait traps at Cape Girardeau on October 10.

Utah. C. J. Sorenson (October 23): Moderately abundant throughout the State. Occasionally found infesting ripening peach fruits in Utah County.

Washington. E. J. Newcomer (October 19): Moths very active in Yakima County until September 26, owing to warm weather.

Oregon. B. G. Thompson (October 20): Active in apples and pears in the Willamette Valley until September 15.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Indiana. J. J. Davis (October 5): Reported as destructive in Whitley County, in northeastern Indiana.

Minnesota. A. G. Ruggles and assistants (October 20): Reported in apples at Saint Paul and in Jackson County.

LEAFHOPPERS (Cicadellidae)

Virginia. A. M. Woodside (October 20): Leafhoppers of the genus Erythroneura still abundant in many apple orchards in Augusta County. E. hartii Gill. is the most common, but E. lawsoniana Bak. and E. obliqua Say are also present. The white apple leafhopper (Typhlocyba pomaria McA.) seems less abundant than a month ago.

Missouri. L. Haseman (October 23): According to report, in southeastern Missouri apple leafhoppers built up during September but, owing to the lateness of the season, did no particular harm to the foliage or by spotting late fruit in October.

WOOLLY APPLE APHID (Eriosoma laniferum Hausm.)

Tennessee. G. M. Bentley (October 23): On the roots of 2-year-old apples in central Tennessee on October 1. Considerable clay in soil, so that it cracks in hot, dry weather.

COMSTOCK'S MEALYBUG (Pseudococcus comstocki Kuw.)

Virginia. W. J. Schoene (October 25): Spread to orchards not heretofore known to be infested. Considerable loss occasioned, owing to the partial covering of the apples on the infested trees with a sooty fungus.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Tennessee. G. M. Bentley (October 23): October brood unusually heavy on peach trees in different parts of Tennessee.

Mississippi. C. Lyle (October 25): Injured peach twigs received on October 2 from Pike County, and injured pear fruit received from Monroe County on September 26. Reports of injury to peach from Copiah and Hinds Counties. Very noticeable injury to peaches reported from Yalobusha County.

Missouri. L. Haseman (October 23): Numerous moths continued to emerge at Columbia up until the first few days in October, and an occasional larva is still present in the fruit. At Cape Girardeau flight of moths reported as practically over during the week ended October 14, and very little evidence of late larvae in peach twigs.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (October 25): Examinations of peach trees in a number of commercial orchards at Fort Valley, central Georgia, during the last week indicate this insect as less abundant than usual. Dry weather during the latter part of the egg-hatching season undoubtedly prevented the entrance of a number of newly hatched larvae.

Mississippi. C. Lyle (October 25): Requests for control measures from Clay, Copiah, Jones, and Tallahatchie Counties during the first half of October. Moderate damage and requests for control information reported from the Jackson area.

Texas. B. K. Fletcher (October 20): Reported in McLennan County on October 4.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. O. I. Snapp (October 20): All adults have left peach trees at Fort Valley for places of hibernation. Population now in hibernation heavier than that of an average year.

PEAR

A MITE (Eupalopsis mali Ewing)

Oregon. E. L. Post (October 2): Attacking leaves of pear at Corvallis. (Det. by E. A. McGregor, who says that there has been an outbreak this year and that the species has been sent in from several localities in Oregon and Washington.)

A PEAR MITE (Tetranychus willanettei McG.)

Oregon. E. L. Post (October 2): Attacking pear leaves at Corvallis. (Det. by E. A. McGregor.)

PLUM

LESSER APPLE WORM (Grapholitha prunivora Walsh)

Oregon. V. B. Nygren (October 16): Larvae collected from prunes, in which they were feeding. Adults emerged. (Det. by C. Heinrich.)



PLUM GOUGER (Anthonomus scutellaris Lec.)

Minnesota. E. Milliron (October 20): Reported on plum at Fort Ripley.

GRAPE

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. G. A. Runner (October 20): Field surveys indicate generally somewhat lighter infestations than in 1938. In northeastern Ohio, where damage was not serious until the last few years, the berry moth is apparently becoming more common and has appeared in vineyards not previously infested.

GRAPE LEAFHOPPER (Erythroneura cones Say)

Ohio. G. A. Runner (October 20): An abundant brood of overwintering adults in some of the vineyards in the Sandusky area.

Texas. R. K. Fletcher (October 20): Reported from Amarillo on October 13.

Utah. G. F. Knowlton (October 10): Responsible for destroying approximately 85 percent of the foliage in a vineyard on Bountiful Bench.

GRAPEVINE APHID (Aphis illinoisensis Shim.)

California. G. H. Kaloostian (May 12): Collected on grape shoots for the first time at Sanger, Fresno County. (Det. by P. W. Mason.)

NUTS

WEEVILS (Curculio spp.)

Georgia. O. I. Snapp (October 14): Larvae of chestnut weevils, probably C. proboscideus F. or C. algonquinus Csy., have ruined nuts on a number of chestnuts on Pine Mountain near Thunder, in Upson County, west-central Georgia.

Mississippi. C. Lyle (October 25): Specimen of the acorn weevil (C. rectus Say) sent in from Jefferson Davis County on September 26.

Texas. W. S. Price (October 25): Severe infestations of the pecan weevil (C. caryae Horn) observed in orchards near Byers, Fort Bend, Farris, Granberry, and Liberty Hill, and in orchards in Bowie and Burleson Counties.

C. B. Nickels and W. C. Pierce (October 28): Near Gustine 200 or more pecan nuts were examined on each of 8 pecan trees and minimum infestation by C. caryae on any tree was 50 percent, maximum 97 percent, and average 89 percent. Estimated that more than two-thirds of the nut crop in seedling pecan orchards near the Leon River, in Comanche County, was destroyed by the pecan weevil.

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Mississippi. L. L. Grimes (October 25): Medium to light infestations in the Meridian area.

A SAWFLY (Monophadnus caryae Nort.)

Maine. H. B. Peirson (October): Larvae of butternut woolly worm, from one-half to full-grown, collected on Japanese walnut on July 20 at South Bristol.

CITRUS

YELLOW SCALE (Chrysomphalus citrinus Coq.)

California. R. S. Woglum (October): Heavy build-up during the last few weeks in parts of eastern San Bernardino County, particularly the Bryn Mawr district. Fruit now being marred in the more heavily infested orchards.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Louisiana. I. J. Beemel (October 25): Abundant throughout the Louisiana citrus section. Groves not treated showed a high percentage of severely tarnished fruit.

LEAFHOPPERS (Cicadellidae)

California. R. S. Woglum (October): For the last several years the green leafhopper has been of increasing importance in central California, feeding on ripening fruit and causing spots or oil-cell injury. Adults move into groves late in summer.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Florida. J. E. Watson (October 21): Troublesome to many plants, especially Satsuma oranges.

AVOCADO

SCALES (Coccidae)

Florida. H. Spencer (September 23): Avocado leaves infested with Florida red scale (Chrysomphalus aonidium L.) and another scale, Aspidiotus spinosus Comst., sent in from Avon Park on September 20. (Det. by H. Morrison.)

TRUCK - CROP INSECTS

CORN EAR WORM (Heliothis armigera Hbn.)

Maryland. E. N. Cory (October 4): Reported as attacking broccoli at Allen, Wicomico County, and damaging snap beans at Salisbury.

Virginia. H. G. Walker and L. D. Anderson (October 24): A great deal of damage in many beanfields in eastern Virginia. One 60-acre field of lima beans near Accomac was so badly damaged that no attempt was made to pick the beans. Nearly all fields of snap beans in Norfolk and Princess Anne Counties and on the Eastern Shore more or less severely damaged. Some damage in young peafields, where worms fed on blossoms and young pods. A 250-acre field of broccoli near Accomac rather heavily infested, counts showing an average of from 5 to 10 larvae per plant, with many plants having as high as 25 larvae. (Last specimens det. by C. Heinrich.)

North Carolina. L. W. Brannon (September 23): Larvae causing severe damage to blossoms and pods in a 10-acre field of bush lima beans at Elizabeth City. Pods injured to the extent that very few marketable pods were harvested. Severe damage to green pea blossoms and pods at Moyock. (Det. by C. Heinrich.)

Georgia. T. L. Bissell (September 29): Heavy infestation of larvae on collards at Clarkston, central Georgia.

Mississippi. C. Lyle and assistants (October 25): Injury to tomatoes reported from the Meridian area and in Madison County early in October. Injury to chrysanthemums reported at State College.

Utah. G. F. Knowlton (October 1): Increased injury to tomatoes reported in the Murray area for the week beginning September 25.

California. R. E. Campbell (October 4): Considerable damage to lettuce appeared last week in the Salinas Valley area.

A. E. Michelbacher (October 23): Infestations in tomato fields in the northern producing region of California as follows: 0 to 12 percent in Alameda County on October 2; 0 to 20 percent in Madera County on October 3; 1 to 3 percent in Merced County; 1 to 10 percent in Stanislaus County on October 10; less than 1 percent to 10 percent in San Benito County on October 17; 1 to 29 percent in Monterey County; and 3.5 to 29 percent in Santa Cruz County on October 19. Many of the larvae observed in the last-named county were very small, indicating that the infestation had set in very late in the season.



CUCUMBER BEETLES (Diabrotica spp.)

South Carolina. J. G. Watts (October): At Blackville practically no striped cucumber beetles (D. vittata F.), very few spotted beetles (D. duodecimpunctata F.), but banded ones (D. balteata Lec.) are abundant, although less so than at this time last year.

Florida. J. R. Watson (October 21): A severe infestation of D. balteata on turnips reported from Putnam County.

Alabama. J. M. Robinson (October 13): D. balteata moderately abundant at Auburn.

Mississippi. M. L. Grimes (October 25): Injury to beans by the spotted and striped cucumber beetles in the Meridian territory.

Louisiana. C. O. Eddy (October 25): Banded cucumber beetle very numerous.

Indiana. D. W. LaHue (October 21): Numerous adults of the southern corn rootworm (D. duodecimpunctata) observed feeding on alfalfa near Crawfordsville on October 20.

Minnesota. A. G. Ruggles (October 20): Striped cucumber beetle very abundant.

Missouri. L. Haseman (October 23): Spotted and striped cucumber beetles have been moving into winter quarters at Columbia since killing frosts earlier in the month.

Kansas. H. P. Bryson (October 24): D. vittata abundant around late squashes. D. duodecimpunctata more abundant than usual, and the adults causing some injury to the flowers and buds of late fall roses, chrysanthemums, and other flowers.

Oklahoma. F. A. Fenton (October 19): The twelve-spotted cucumber beetle again causing widespread damage to flowers, especially chrysanthemums and dahlias.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Mississippi. C. Lyle and assistants (October 25): Specimens from soybeans received from Jefferson Davis County on September 29, and a report of injury to beans in Jasper County on October 3. Injury to beans and cowpeas reported from the Meridian area. In the southeastern part of the State serious injury to beans, cowpeas, and other truck crops noted.

GREEN STINKBUG (Acrosternum hilare Say)

Mississippi. C. Lyle and assistants (October 25): Specimens received on September 29 from Yazoo County, where they were feeding on lima beans. Report of injury to lima beans throughout the Grenada area.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Tennessee. G. M. Bentley (October 23): Extremely few in all parts of the State throughout the season.

North Dakota. J. A. Munro (October 21): Tachinids reared from larvae collected at Grand Forks and Fargo during the last summer determined by H. J. Reinhard as Doryphorophaga doryphorae Riley. About 30 percent of the larvae parasitized.

TOMATO PINWORM (Keiferia lycopersicella Busck)

California. A. E. Michelbacher (October 23): Infestations found as follows in a survey made of the tomato fields in the northern producing region of California: None in Alameda County on October 2; from 4.5 to 72 percent in Madera County on October 3; from 5 to 91 percent in Merced County on October 9; none in Stanislaus County on October 10, in San Joaquin County on October 13, in San Benito County on October 17, in Monterey County, nor in Santa Cruz County on October 19.

POTATO TUBER WORM (Gnorimoschema operculella Zell.)

Nebraska. M. H. Swenk (October 17): Found on September 28 to have injured severely about 125 bushels of potatoes in Cass County. This is the first record of this pest for the State.

California. A. E. Michelbacher (October 23): Survey of the tomato fields in the northern producing region of California showed the following infestations: From 0 to 5.5 percent in Alameda County on October 2; none in Madera County on October 3 nor in Merced County on October 9; from 0 to less than 1 percent in Stanislaus County on October 10; from 0 to 4 percent in San Joaquin County on October 13; from 0 to 3 percent in San Benito County on October 17; from 0 to 5 percent in Monterey County; and, from less than 1 percent to 12 percent in Santa Cruz County on October 19.

HORNWORKS (Protoparce spp.)

California. A. E. Michelbacher (October 23): Throughout most of the northern tomato-producing section the tobacco hornworm (P. quinquemaculata Haw.) and the tomato hornworm (P. sexta Johan.) were less abundant than in 1938. Very little damage.

POTATO AND TOMATO PSYLLID (Paratrioza cockerelli Sulc)

Minnesota. H. Milliron (October 20): On tomato at Moorehead.

LEAFHOPPERS (Empoasca sp.)

Utah. G. F. Knowlton (October 5): Seriously spotting the leaves of some late potatoes at Plain City.

CITRUS MEALYBUG (Pseudococcus citri Pisso)

Oklahoma. F. A. Fenton (October 19): Reported on tubers of potatoes in Konawa, Seminole County, and in Pauls Valley, Garvin County.

THRIPS (Thysanoptera)

Utah. G. F. Knowlton and W. P. Nye (September 29): Frankliniella moultoni Hood and Thrips tabaci Lind. are infesting tomatoes at Hooper. Damage to tomatoes observed in several localities this season. (Det. by S. F. Bailey.)

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

South Carolina. J. G. Watts (October): Abundant and doing much damage to lima and string beans in Barnwell County in September and early in October. More abundant in September than in August.

Alabama. J. M. Robinson (October 13): Moderately abundant at Auburn.

Mississippi. C. Lyle and assistants (October 25): Injury to beans reported from Jasper, Oktibbeha, and Tippah Counties. Also reported as very destructive to late beans in northern Yalobusha County, while general heavy infestations prevail in the Meridian area and throughout the northeastern part of the State.

Missouri. L. Haseman (October 23): According to report from Cape Girardeau, beetles were largely in hibernation by the middle of October.



A LOOPER (Autographa sp.)

Virginia. H. G. Walker and L. D. Anderson (October 24): Very destructive to beans near Urbana and in some fields on the Eastern Shore. It fed on leaves, blossoms, and pods of snap and lima beans. (Det. by C. Heinrich.)

PEAS

PEA WEEVIL (Bruchus pisorum L.)

Utah. G. F. Knowlton (October 20): All canning peas raised at Butlerville, Salt Lake County, condemned, owing to an outbreak.

CABBAGE

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker and L. D. Anderson (October 24): Reported as rather seriously injuring a field of cabbage in Northampton County.

Tennessee. G. M. Bentley (October 23): Very abundant on turnips, kale, and late cabbage in various counties in the State.

Mississippi. C. Lyle (October 25): Injury to collards reported from Carroll and Grenada Counties and from Meridian.

CABBAGE LOOPER (Autographa brassicae Fieley)

Virginia. H. G. Walker and L. D. Anderson (October 24): Outbreak started about 1 month ago at Norfolk, but loopers soon died from disease.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

Minnesota. H. Milliron (October 20): Reported from Minneapolis and on pumpkin at Waldorf.

Missouri. L. Haseman (October 23): Since the killing frosts early in the month squash bugs have been moving into winter quarters at Columbia.

CUCUMBERS

MELONWORMS (Dicophania spp.)

Georgia. O. I. Snapp (September 22): Many cucumbers ruined by the melonworm in a 14-acre field at Fort Valley, central Georgia.

H. I. Borders (October 6): In inspecting fall plantings of cucumbers at Tifton, several instances of heavy pickleworm infestations were observed.

#### ASPARAGUS

##### ASPARAGUS BEETLE (Crioceris asparagi L.)

South Carolina. J. G. Watts (October): Unimportant throughout the season in Barnwell County. A larval parasite, Stenatolydella infernalis Towns., became active in June, increased in activity until October 1, but not considered important in holding down beetle population.

Utah. G. F. Knowlton (October 5): Larvae very abundant on some asparagus plants examined at Sunset and Plain City.

#### TURNIP

##### CABBAGE WEBWORM (Hellula undalis F.)

South Carolina. J. G. Watts (October): Common on turnips at Blackville during September and October, but no serious damage done.

Mississippi. M. L. Grimes (October 25): Reports of injury to turnips by a webworm, supposed to be this species, in the Meridian area.

##### A STRIPED FLEA BEETLE (Phyllotreta vittata discedens Weise)

Mississippi. C. Lyle (October 25): Specimens of the southern form of the striped flea beetle received on October 23 from Leflore County, with a report of heavy damage to turnips.

##### BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. G. F. Knowlton (October 13): Adults moderately abundant on turnips at North Farmington.

#### SPINACH

##### HAWAIIAN BEET WEBWORM (Hymonia fascialis Cram.)

Virginia. H. G. Walker and L. D. Anderson (October 24): A very heavy outbreak has occurred on spinach in Norfolk, Princess Anne, and Northampton Counties. Millions of moths present in this area, but spinach and beets the only crops seriously injured.

LETTUCE

SUGAR-BEET FOOT APHID (Pemphigus betae Doane)

California. E. E. Campbell (October 5): The aphid on lettuce in the Salinas-Watsonville district, reported on page 502 of the Insect Pest Survey Bulletin dated October 1, 1939, has been identified as the above.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Louisiana. C. O. Eddy (October 25): Reports indicate that the infestation is running higher than usual.

MUSHROOMS

MUSHROOM INSECTS (Diptera)

Pennsylvania and Delaware. C. A. Thomas (October 25): Cecidomyiid larvae (Mycophila sp. and others) are very abundant in the mushroom district from Nottingham to Kennett Square, Chester County, Pa., and south into the mushroom houses of northern Delaware. Much damage. Paedogenic larvae very common, from 12 to 20 new larvae being produced from the mother larva. Infested mushrooms refused for canning purposes.

A MITE (Tarsonemus sp.)

Pennsylvania. C. A. Thomas (October 25): Abundant in some of the mushroom houses in the mushroom district from Nottingham to Kennett Square, turning the stem-base red by their feeding.



C O T T O N   I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

Florida. C. S. Rude (October 14): Abundant in all fields in Alachua, Marion, and Lake Counties, breeding on second-growth cotton. Population about the same as a year ago.

Alabama. J. M. Robinson (October 13): Moderately abundant at Auburn.

Mississippi. C. Lyle (October 25): Considerable injury to late cotton. Large numbers will be present to enter hibernation in most sections of the State.

E. W. Dunnam, et al. (September 30): About half as numerous as at this time last year in Washington County. A few still emerging from late bolls that are now opening. Few remaining squares almost destroyed by excessive feeding. Not much damage in open plantations this season; most damage occurring in cotton near wooded areas, but even there breeding was low, owing to dry season. (October 7): Still emerging from late bolls. Emergence about equal to mortality, as the population appears to be at a standstill. The parasites reported as attacking grubs in bolls appear to be Microbracon mellitor Say. (October 28): Cool nights have caused weevils to disappear. Mostly in poor condition; possibly a few young weevils in fair condition.

R. L. McGarr (October 21): Squares still plentiful in most of the late cotton in Oktibbeha County. Present field conditions continue to indicate that a large number of weevils will be ready to enter hibernation within a short time. (October 28): Squares plentiful, and weevils still active.

Louisiana. I. J. Becnel (October 25): Damage on early cotton somewhat severe. Extremely hot and dry weather in July and August reduced infestations throughout Red River Valley. Late cotton near Baton Rouge severely attacked.

Oklahoma. F. A. Fenton (October 19): More abundant on cotton in vicinity of Stillwater than since 1936. In 1937 and 1938 it was rare in Payne County, but this year most of the squares and late bolls have punctures and weevils are abundant.

Texas. K. P. Ewing, et al. (October 21): On October 13, 10,000 weevils were caught, counted, and released in the series of hibernation cages at Waco, McLennan County. Much easier to

catch than anticipated. Field in which they were caught had produced practically no cotton, owing to early flea hopper (Psallus seriatus Feut.) and late weevil damage. Cotton squared abundantly, and weevils exceedingly plentiful.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. L. F. Curl (August 28): Another county, hitherto not infested, brought into the infested group, when one specimen was taken at El Indio, Maverick County, on August 24. An additional specimen reported from the same place on August 26 but not yet received. Additional specimens found in Jim Hogg and Duval Counties before inspection was completed there, making a total of 21 from Duval County and 12 from Jim Hogg.

R. E. McDonald (September 21): Heavy infestation found in the southern part of Cameron County, and, during the period of gin-trash inspection, a general to light infestation found in all other south Texas counties. Incipient infestations found during August in Duval, Jim Hogg, La Salle, Maverick, Webb, and Zapata Counties, lying just outside of the regulated area of south Texas. Light infestation found in two okra fields in August in the Brownsville area of the lower Rio Grande Valley. (October 3): Another find in territory hitherto not known to be infested made on September 25, when 1 specimen was found in gin trash at San Angelo. This was from a bulk sample containing trash from Tom Green, Sterling, and Irion Counties. On September 29, 4 specimens found in sample from Eola, Concho County.

COTTON LEAF WORM (Alabama argillacea Hbn.)

South Carolina. J. G. Watts (October): Observed in South Carolina probably a little later than last year. Few larvae observed throughout September, causing little defoliation. Extensive defoliation not noted until about October 10 and then only in isolated fields in several central and southwestern counties.

Florida. C. S. Rude (October 14): Another generation made its appearance during the last week and has stripped the plants in many fields in Alachua, Marion, and Lake Counties.

Mississippi. C. Lyle (October 25): Spotted infestations reported from the lower Delta, and light infestations from the central section, the Meridian area, and from Oktibbeha and Lowndes Counties. Infestation at State College lighter than usual.

R. L. McGarr (October 21): Very numerous this week in one field of cotton in Oktibbeha County. Moths very numerous in two other fields where they had recently emerged.

Louisiana. R. C. Gaines and assistants (October 7): Some ragging observed in second-growth cotton in Madison Parish.

Tennessee. G. M. Bentley (October 23): None appeared in Tennessee until about the middle of September. Owing to the dry, hot weather they appeared only in small patches and did no damage. On October 12 at Medina, Gibson County, a cotton field was found having fully 70-percent defoliation, but too late to cause any damage.

#### APHIDS (*Aphididae*)

Mississippi. E. W. Dunnam, et al. (October 28): Again increasing on the tops of plants, bracts, and stems in Washington County. Unusually dark in color. The species which appears to be the cotton aphid (*Aphis gossypii* Glov.) is less numerous but increasing slightly on the lower leaves.

#### COTTON STAINER (*Dysdercus suturellus* H. S.)

Florida. C. S. Rude (September 30): Becoming abundant in most fields in Marion and Alachua Counties. Some damage resulting from crushing the nymphs in picking cotton. More abundant a year ago and a good deal more damage done, as it appeared much earlier in the season.

#### A MIRID (*Creontiades femoralis* Van D.)

Arizona. W. A. Stevenson (September 23): A comparatively heavy infestation noted in a field of long-staple cotton at Sahuarita, Pima County. Insects have apparently bred up in the cotton. Infestation developed too late in the season to cause appreciable damage.



F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

FALL WEBWORM (Hyphantria cunea Drury)

- Massachusetts. A. I. Bourne (October 5): There has been an unusually severe infestation on the lower Cape in Barnstable County.
- Virginia. C. R. Willey and F. R. Fround (October): Very abundant in southeastern part of the State.
- South Carolina. J. G. Watts (September): Beginning late in July this insect was common in several southwestern counties on persimmon. In August and September it was prevalent on pecan in most sections of the State.
- Florida. J. R. Watson (October 21): Very abundant over the northern part of Florida.
- Mississippi. C. Lyle (October 25): Unusually heavy infestations on hickory, pecan, and persimmon reported from practically the entire State.
- Indiana. J. J. Davis (October 5): Rather prevalent throughout the State.
- Missouri. A. C. Burrill (September 6): There has been a growing epidemic for over a fortnight at Jefferson City. Some young mulberries were completely skeletonized.
- Texas. R. K. Fletcher (September 29): The fall webworm was noted in Ochiltree County.

GYPSY MOTH (Porthetria dispar L.)

- Vermont. S. S. Crossman (October 2): A scouting crew working in Warren Township, Washington County, on September 18-23, located a small gypsy moth infestation. Because the growth in the vicinity is not especially favorable as gypsy moth food, it is anticipated that it will not be difficult to exterminate the insect.
- Massachusetts. S. S. Crossman (September 16): On September 13 a gypsy moth was discovered depositing eggs. This is unusually late, as practically all egg clusters are deposited by the end of August. This observation was made in Cummington Township, Hampshire County, and a similar one was reported from Pennsylvania at about the same time.

Connecticut. S. S. Crossman (September 30): Recently a small infestation was found in Woodbury, Litchfield County. So far as known, this is the first infestation in the township.

WALKINGSTICKS (*Phasniidae*)

Virginia. C. R. Willey and F. R. Freund (October): *Diapheromera femorata* Say damaged a locust tree on Skyline Drive, 4 miles south of Front Royal. On October 5 several acres of young locust trees were observed to be practically defoliated.

Tennessee. G. M. Bentley (October 23): Walkingsticks have been more prevalent in woodlands than for many years.

PIGEON TREMEX (*Tremex columba* L.)

Maryland. E. N. Cory (October 18): Noted on oak twigs at Baltimore.

Minnesota. H. Milliron (October 20): Reported on elm at Minneapolis.

BEECH

BEECH SCALE (*Cryptococcus fagi* Baer.)

Maine. L. D. Casey (October 24): Infestations have built up considerably during the last year in the sample plots in the eastern and central parts of the State. The insect has spread to a number of trees not previously infested. No increase in the number of dead or dying beech trees in the plots this year, but in most of the plots the degree of *Nectria* infection and the number of trees affected by it were increased.

New Hampshire. J. V. Schaffner, Jr. (October 24): One infested beech tree has been found at Bartlett. This is the first record of the insect from the White Mountains.

New York. F. C. Brown (October 24): Apparently distributed over the whole of Westchester County. In most places the infestation is light, although a few trees had a medium infestation. In Rockland County a few lightly infested beech stands were observed.

BEECH LEAF SKELETONIZER (*Psilocorsis faginella* Chamb.)

Maine. H. B. Peirson (September 10): Heavy infestation throughout most of the northern two-thirds of the State.

L. D. Casey (October 5): There has been considerable feeding on beech trees in the eastern part of the State,

especially throughout Washington, Hancock, and Waldo Counties. In some localities in Washington County 75 percent of the beech foliage was affected, while in the vicinity of Liberty, Waldo County, the amount of foliage skeletonized ranged from only 10 to 25 percent.

#### BIRCH

##### BRONZED BIRCH BORER (Agrilus anxius Gory)

Maine. J. V. Schaffner, Jr. (October 24): Extensive mortality of mature yellow and white birch observed in the southern part of Aroostook County, near Smyrna Mills.

Vermont. H. L. Bailey (October 26): Damage severe in yellow birch in forest areas about Ripton, Addison County, western part of the State.

##### BIRCH SKELETONIZER (Bucculatrix canadensisella Chamb.)

New York. R. E. Horsey (October 16): A number of river birch in an ornamental planting in Rochester noted with leaves badly skeletonized, although no live insects were found.

##### A MEMBRACID (Platycotis vittata F.)

Virginia. C. R. Willey and F. R. Freund (October 9): Damaging white birch at Locustdale.

##### AN APHID (Calaphis betulae Buckton)

New Jersey. M. D. Leonard (October 17): Many white and gray birch trees at Ridgewood, commonly infested earlier in the year and during the last several years usually considerably infested in the fall, seem to have been almost devoid of this aphid for some time.

##### APHIDS (Aphididae)

Utah. G. F. Knowlton (September 28): Pather abundant on a few weeping birch trees at Hooper and Ogden.

#### BOXELDER

##### BOXELDER BUG (Leptocoris trivittatus Say)

Pennsylvania. C. A. Thomas (October 25): A heavy infestation is occurring at Coatesville, Chester County, where damage to box-elders has been caused. At present they are to be found in



large groups on the trunks and lower branches of these trees and upon and in nearby houses, where they congregate on the warmer southern side of the buildings. All stages, from half-grown nymphs to the adults, are present.

CATALPA

CATALPA SPHINX (Ceratonia catalpae Bdv.)

Indiana. J. J. Davis (October 5): Common throughout the State during the last month.

ELM

ELM FLEA BEETLE (Altica ulmi Woods)

Maine. H. B. Peirson (August): Very abundant on elm at Augusta, Portland, and many towns in southern Maine.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Nebraska. M. H. Swenk (September 19): Reported as heavily infesting trees in Chase County.

A TERMITE (Reticulitermes flavipes Koll.)

North Carolina. D. L. Wray (September 24): Young Chinese elm trees were severely damaged at Forest City and Green Hill, Rutherford County.

HICKORY

HICKORY LEAF STEM GALL (Phylloxera caryaecaulis Fitch)

Massachusetts. E. P. Felt (October 23): Troublesome in Boston area.

LARCH

LARCH SAWFLY (Lygaconematus erichsonii Htg.)

Pennsylvania. T. J. Parr (October 5): Larch plantations at Paradise Furnace near Mount Union, infested heavily last year, carried a much lighter infestation this summer and apparently will be still more lightly infested next year. Reduction owing mainly to destruction of cocoons by rodents.

LINDEN

AN APHID (Myzocallis tiliae L.)

New Jersey. M. D. Leonard (October 17): Several large street trees at Ridgewood, under observation and apparently uninfested during the long dry summer, now show scattered leaves with one or two aphids present on each.

MULBERRY WHITEFLY (Tetraneura mori Quaint.)

New Jersey. M. D. Leonard (September 25): A large street tree (American linden) examined at Ridgewood, showed a moderate infestation on the undersides of the leaves. (Det. by Louise M. Russell.)

LOCUST

LOCUST BORER (Cyrtoneura robiniae Forst.)

Virginia. C. R. Willey and F. R. Freund (October): Observed as very abundant on goldenrod from Winchester to Roanoke and into Appomattox during the week of September 17.

MAPLE

. AN APHID (Dropanaphis acerifoliae Thos.)

New York. M. D. Leonard (October 21): Some large maple trees at Flushing were very lightly infested, and sexual apterous females were among those present.

NORWAY MAPLE APHID (Periphyllus lyropictus Koss.)

New Jersey. M. D. Leonard (October 17): Several small maple trees, apparently uninfested much earlier in the season, recently developed small colonies on some of the leaves.

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Maine. H. B. Peirson (August 25): There was a heavy stripping of maple trees in Townships 30 and 35, east-central Maine.

A BORER (Proteoteras aesculana Riley)

Virginia. H. G. Walker and L. D. Anderson (October 24): Observed feeding in the tender growing shoots of maple seedlings at Norfolk.

OAK

HORNED OAK GALL (Andricus cornigerus O. S.)

New York. E. P. Felt (October 23): Reported as somewhat abundant at Monroe.

Mississippi. C. Lyle (October 18): Received from Lee County.

AN APHID (Myzocallis bella Walsh)

New York. M. D. Leonard (October 17): A pin oak tree at Flushing, under observation all season, lately became reinfested so that many leaves had 20 to 30 aphids each, and some honeydew was present. Alates were not numerous.

OAK LACEBUG (Corythucha ciliata Say)

Maryland. E. N. Cory (September 29): Was attacking oak leaves at Towson.

OBSCURE SCALE (Chrysomphalus obscurus Const.)

Delaware. E. P. Felt (October 23): Occurred abundantly on oak at Wilmington.

PERSIMMON

TWIG PRUNER (Hypernallus villosus F.)

Indiana. J. J. Davis (October 5): Is common, especially in southwestern part of the State.

PINE

SAWFLIES (Neodiprion spp.)

Maine. H. B. Peirson (September 11): There was quite a heavy infestation of the pitch pine sawfly (N. pini-rigidæ Nort.) at Cape Porpoise on pitch and white pine. Larvae were nearly full grown, and had jet-black heads, although sometimes described as brown. (September 5): Larvae of Abbott's sawfly (N. pinetum Nort.) were collected at West Southport.

Minnesota. H. Milliron (October 21): N. pinetum was reported at Lake City on white pine.

Alabama. J. M. Robinson (September 18): The red-headed pine sawfly (N. lecontei Fitch) was reported on evergreens at Fufaula and Wedowee.



A WEEVIL (Hyllobius radialis Buch.)

Massachusetts. J. V. Schaffner, Jr. (October 12): It was reported in May 1939. that a plantation of Scotch and Corsican pine in Weston was heavily infested. Thus far, only the trees which were wind-thrown in the storm of September 21, 1938, have died. Many of the standing trees are now heavily infested and the root-collars in many cases almost completely girdled. Adults, both teneral and older active specimens, were observed on October 12, as well as larvae ranging from about one-fourth grown to nearly full grown.

AN APHID (Dilachnus sp.)

Minnesota. H. Milliron (October 20): Was reported on Scotch pine at Hasty, Wright County.

PINE BARK APHID (Pinus strobi Htg.)

Minnesota. A. G. Ruggles (October 20): Abundant on white pine over the State.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New Jersey. E. P. Felt (October 23): Was found abundant at Maplewood.

PITCH TWIG MOTH (Petrova comstockiana Fern.)

Minnesota. H. Milliron (October 20): Reported on jack pine at Akeley, Hubbard County.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Illinois. H. J. MacAloney (October 16): Taken from the Rosiclare Ranger District of the Shawnee National Forest. (Det. by C. Heinrich.)

SPRUCE

EUROPEAN SPRUCE SAWFLY (Diprion polytorum Htg.)

Maine. H. B. Peirson (September 10): Over 2,500 reports of the presence of the European spruce sawfly in Maine were received this summer. The widespread outbreak is increasing in intensity in sections of northern and eastern Maine. The State reared and liberated over 100,000,000 Microplitis fuscipennis Zett., a parasite on the sawfly cocoons, this year.

New Hampshire. P. B. Dowden (October 24): During 1939 areas heavily infested in southern New Hampshire, near Dublin, and southern Vermont, near Wilmington, increased in wide circles, but feeding was less severe in the stands heavily attacked in 1938. The severely affected area in southern Vermont now includes about 50 square miles and that in southern New Hampshire about 100 square miles. In central Vermont, at Lincoln, infestation became greatly reduced. The sawfly is generally present in small numbers throughout the spruce areas of both Vermont and New Hampshire.

Vermont. H. L. Bailey (October 26): This season showed expansion of heavy infestation in Wilmington-Marlboro area, Windham County, south-central Vermont. Infestation was less intensive, however, in areas of heaviest defoliation last season. Population built up on periphery of infestation as it receded in the interior. Much smaller number of cocoons per foot present than were found last year.

SPRUCE NEEDLE MINER (Taniva albolineana Kearf.)

Maine. H. B. Peirson (June 13): Larvae were attacking spruce in Augusta and were nearly full grown.

Minnesota. H. Milliron (October 20): Reported on spruce at Northfield.

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Minnesota. A. G. Ruggles (October 20): Very abundant. Several bad infestations in the Redlake area.

SPRUCE GALL APHID (Pineus pinifoliae Fitch)

Maine. H. B. Peirson (September 11): Very abundant at Seal Harbor, on Mount Desert Island.

Massachusetts. P. B. Dowden (August 11): Aphid galls on tips of red spruce twigs collected at Ashfield, Franklin County, in western Massachusetts. (Det. by P. W. Mason.)

COOLEY'S SPRUCE GALL (Adelges cooleyi Gill.)

Delaware. E. P. Felt (October 23): On oriental spruce at Wilmington.

WILLOW AND POPLAR

POPLAR AND WILLOW BORER (Sternochetus lanathi L.)

Minnesota. H. Milliron (October 20): Reported from Newport as attacking willow and poplar.

Oregon. W. D. Edwards (October 23): Attacking willow, poplar, and birch at Portland. Hatching has proceeded until 85 percent are now in the larval stage.

WILLOW GROVE PLANT LOUSE (Melanoxanthium smithiae Monell)

Indiana. J. J. Davis (October 5): Frequently reported from many places in the northern half of the State. The migrating habits of this species during the fall months, and the blood-red stain left when crushed, perhaps reasons for numerous reports.

COTTONWOOD SCALE (Chionaspis ortholobis Comst.)

Nebraska. M. H. Swenk (October 12): Infesting golden willows in Madison County.

I N S E C T S    A F F E C T I N G    G R E E N H O U S E  
A N D    O R N A M E N T A L    P L A N T S

WHITEFLIES (Aleurodidae)

North Carolina. D. L. Wray (October 1): Considerable damage to field-grown gardenias at Peachland, Anson County.

Mississippi. C. Lyle and assistants (October 25): A report of injury by the citrus whitefly (Dialeurodes citri Ashm.) to camellia in Hinds County was received. Also reports of injury to Cape-jasmine received from Grenada, Montgomery, and Hinds Counties. There were heavy infestations of this whitefly on ornamentals in the Meridian area, and on citrus and ornamentals in the southeast.

OYSTERSHELL SCALE (Leucidosaphes ulmi L.)

Virginia. C. R. Lilley and F. R. Freund (September 23): Reported on peonies at Richmond.

Minnesota. A. G. Ruggles and H. Milliron (October 20): Oystershell scale is very abundant.

Nebraska. M. H. Swenk (October 3): Infesting elm trees in Custer County.

FLORIDA RED SCALE (Chrysomphalus aonidium L.)

Mississippi. F. A. Smith (October 14): Noted on camellia in Lafayette County.



SOFT SCALE (Coccus hesperidum L.)

Mississippi. C. Lyle (September 25): Recorded on cactus and pepper plants in Lincoln County.

A SCALE (Locanium fletcheri Ckll.)

Maine. H. B. Peirson (July 1): Juniper scale was locally abundant in Augusta on pyramidal juniper.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Virginia. C. F. Willey and F. R. Freund (September 23): Noted on candytuft at Richmond.

FLOWER THRIPS (Frankliniella tritici Fitch)

Minnesota. H. Milliron (October 20): Reported on flowers at Hinckley.

AZALEA

AZALEA LEAF MINER (Gracilaria azaleella Brants)

Virginia. H. G. Walker and L. D. Anderson (September): Heavily infested a planting of azaleas at Norfolk in September. (Det. by C. Heinrich.) The parasite Synaldis dolichogaster Ashm. (det. by A. B. Gahan) was reared from the pest.

A NOTODONTID (Datana major G. & R.)

Virginia. H. G. Walker and L. D. Anderson (October 24): Observed rather heavily infesting a planting of azaleas at Norfolk.

AZALEA SCALE (Eriococcus azaleae Comst.)

Mississippi. H. L. Grimes (October 24): Light local infestations reported from Meridian.

CAMELLIA

TEA SCALE (Fiorinia theae Green) ..

Mississippi. G. L. Bond (September 25): Noted on camellia from Forrest County. Heavy infestations on camellias were reported from the southeastern part of the State.

CAMPOR

AVOCADO RED MITE (Paratetranychus gothersi McG.)

Florida. J. E. Watson (October 21): Very abundant on camphor in most parts of the State, causing russeting of the foliage.

CANNA

LARGER CANNA LEAF ROLLER (Calpododes ethlius Cram.)

Georgia. O. I. Sharp (September 22): Seriously damaged a clump of cannas at Fort Valley, central part of the State.

COLU BINE

AN APHID (Pergandeidia trirhoda Walk.)

New Jersey. M. D. Leonard (October 17): Several columbine plants at Ridgewood were reported recently as but very lightly infested **and still remain so**, although last fall at this time the lower leaves had plenty of this aphid. Almost no alates present.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Const.)

New York. M. D. Leonard (October 7): Euonymus twigs heavily infested were brought in for identification and control.

FIRETHORN

A LACEBUG (Corythucha cydoniae Fitch)

Mississippi. C. Lyle (September 25): Specimens received from Washington County. They were feeding on Pyracantha sp.

LEAF CRUMPLER (Mimola indigenella Zell.)

Texas. R. K. Fletcher (October 20): Very common on highway plantings of Pyracantha sp. throughout the central part of the State.

GLADIOLUS

THRIPS (Thripidae)

Louisiana. C. O. Eddy (October 25): The gladiolus thrips (Taeniothrips simplex Morison), so abundant on glads last spring, are not found on fall glads.

Utah. G. F. Knowlton and W. P. Hye (September 29): Gladioli at Logan were infested by Frankliniella moultoni Hood, Thrips tabaci Lind., and T. simplex. Damage reported from a number of gardens. (Det. by S. F. Bailey.)

HAWTHORN

AN APHID (Eriosoma crataegi Oestl.)

New York. H. D. Leonard (October 20): A fair-sized Crataegus sp. at Flushing was reported as having a number of terminal twigs heavily encrusted with this aphid, and has gradually been losing them, until now only a few small patches are left. Infested twigs have lost their leaves prematurely.

A BORER (Oberea tripunctata Swed.)

Missouri. A. C. Burrill (September 20): Noted in trunk of dying hawthorn on Capitol grounds at Jefferson City. (Det. by W. H. Anderson.)

LILAC

GIANT HORNET (Vespa crabro L.)

Pennsylvania and New Jersey. E. P. Felt (October 23): Caused material injury to lilac at Cynwyd, Pa., and Orange, N. J.

LILIES

AN APHID (Macrosiphum lillii Monell)

Maryland. F. F. Smith (October 24): Heavy infestation developed in field cages at Beltsville and killed the host plants, Lilium formosum. In other cages first sexual forms were observed on October 19.

BULB MITE (Rhizoglyphus hyacinthi Bdv.)

Oklahoma. F. A. Fenton (October 19): Reported on lily bulbs in a greenhouse at Chandler, Lincoln County.

MAGNOLIA

MAGNOLIA SCALE. (Neolecanium cornuparvum Thro)

Massachusetts. E. P. Felt (October 23): Reported to be very abundant on a magnolia tree near Boston.



TULIPTREE SCALE (Toumeyella liriodendri Gmel.)

Virginia. C. F. Willey and F. R. Fround (October 20): Was hatching on magnolias collected in Norfolk.

OLEANDER

FOLKA DOT WASP MOTH (Syntomeida epilais Walk.)

Florida. J. R. Watson (October 21): The larvae have proved injurious as far north as Lake City, Columbia County, and Jacksonville, Duval County, on oleanders.

ROSE

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (October 17): Many rose bushes and vines at Ridgewood, which have been reported as but very lightly infested for some time past, seem to have had no aphids for several weeks.

AN ERIOPHYID MITE (Callyntrotus schlectendali Nal.)

District of Columbia. C. A. Weigel and G. V. Johnson (August 24): Taken on rose from a garden in Washington. (Det. by H. H. Keifer.):

SNAPDRAGON

A MIRID (Halticus bracteatus Say)

North Carolina. D. L. Wray and C. S. Brimley (September 30): This hemipteron was feeding on snapdragon at Cornelius, Mecklenburg County, and doing severe damage.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

Massachusetts. A. I. Bourne (October 5): It was reported from Cape Cod in July and August that there was an outbreak of the mosquito Mansonia perturbans Walk., which was stated to have been more severe than during any previous year since mosquito-control work was begun in that section.

Tennessee. G. M. Bentley (October 23): During September and October mosquitoes, Culex pipiens L., have been nestiferous in places where environs are favorable for their breeding.

CRAB LOUSE (Phthirus pubis L.)

Pennsylvania. C. C. Zeliff (October 2): Thirty-two specimens were collected on a man at State College.

BROWN DOG TICK (Phipicephalus sanguineus Latr.)

Virginia. H. G. Walker (October 16): Causing a great deal of trouble in a kitchen and on a dog at Norfolk; also reported as very abundant. (Det. by Helen L. Trembley.)

Indiana. J. J. Davis (October 5): Becoming generally distributed, and one of the most annoying pests in homes.

Mississippi. C. Lyle (October 3): Infesting dogs in Bolivar County.

California. H. H. Keifer (September 13): Taken in an apartment house in Los Angeles. This species was supposed to be exceedingly abundant in this particular location and to be causing annoyance. (Det. by F. C. Bishopp.)

Arizona. C. D. Lebert (October 1): Correction.--The tick, Dermacentor occidentalis Neum., reported on page 521 of the Insect Pest Survey Bulletin dated October 1, 1939, has been determined by F. C. Bishopp as R. sanguineus.

EAR TICK (Ornithodoros megnini Duges)

Oregon. D. C. Mote (October 15): A specimen was reported to have been removed from the ear of a man in Moro, Sherman County.

This species is rather uncommon in Oregon. It is not known to be widely distributed, as it has been reported only in the following counties: Malheur, Umatilla, Sherman, Wasco, and Jefferson.

BLACK WIDOW SPIDER (Latrodectus nactans F.)

Oregon. D. C. Mote (October 23): A water meter inspector in Philomath, Benton County, reported having obtained three specimens of black widow spider from the small recesses in the ground in which water meters are placed. This same inspector found several specimens in the same locality 4 or 5 years ago when the spider appeared to be quite abundant and considerable publicity was given to this form. During the last few years only an occasional specimen has been reported or brought into the laboratory.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Florida. A. L. Brody and E. B. Blakeslee (October 12): A case of true screwworm was found in the horn of a sheep. Larvae were in the second instar at Panama City.

STABLEFLY (Stomoxys calcitrans L.)

Florida. S. W. Simmons and E. E. Rogers (October): Heavy rains on September 24 and 25 caused a sudden drop in abundance of the stablefly in Bay County, and this continued until October 13, when there was a rather sudden reappearance following several days of north wind. Little breeding was observed in sea grass during the period of scarcity.

A. L. Brody (October 13): A resident of Panama City told of the reappearance of the dog flies in swarms after an absence of about 3 weeks. These flies were first noticed at 7.30 a. m. on October 13.

Missouri. L. Haseman (October 23): Since September horn flies and stableflies (Haematobia irritans L. and S. calcitrans) have been rapidly reducing in numbers, but a few are still present.

Utah. G. F. Knowlton (September 28): Stableflies are annoying to man at Syracuse. (October 19): Among flies present in a school at Logan were a few stableflies.



LONE STAR TICK (Amblyomma americanum L.)

Virginia. C. R. Willey and F. R. Freund (September 25): Attached to a man's leg at Richmond. (Det. by F. C. Bishopp.)

SWINE

HOG LOUSE (Haematopinus adventicius Neum.)

Tennessee. G. M. Bentley (October 15): Prevalent over the State on hogs wherever attention is not directed toward its control.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

ANTS (Formicidae)

Mississippi. J. Milton (October 25): Specimens of the Argentine ant (Iridomyrmex humilis Mayr) were sent in from Lafayette, Lowndes, Oktibbeha, and Tate Counties. Reports of annoyance were received from Hinds and Scott Counties.

Oklahoma. F. A. Fenton (October 19): The red harvester ant (Pogonomyrmex barbatus F. Smith) was reported at Weatherford, Custer County, and at Ponca City, Kay County.

Nebraska. M. H. Swenk (October 17): On October 6 specimens of the ant Crematogaster lineolata Say were found infesting houses in Douglas County, and on October 11 an apartment building was reported to be infested with the Pharaoh's ant (Monomorium pharaonis L.)

FIELD CRICKET (Gryllus assimilis F.)

Virginia. C. R. Willey and F. R. Freund (October): Fairly abundant in Richmond this fall. Several reports of this insect as attacking silk clothing.

Arizona. C. D. Lebert (September): These crickets appeared in great numbers on September 7 and 8, following heavy rains of September 4 and 5, and entered many of the Phoenix business houses by the millions. Constant control measures were necessary for a period of about 1 week, to take care of the many infestations. Severe damage threatened several of the furniture stores. (Det. by A. B. Gurney.)

A ROACH (Supella supellectilium Serv.)

Mississippi. C. Lyle (September 20): Specimens received from one locality in Panola County.

GREENHOUSE STONE CRICKET (Tachycines asymmorus Adel.)

Ohio. A. B. Gurney (September 20): Crickets were numerous in greenhouses and barn in Cincinnati, according to a correspondent who sent specimens. They were attacking greenhouse crops and chrysanthemums.

A CLOTHES MOTH (Tincola walsinghami Busck)

Florida. J. R. Watson (October 21): Very prevalent in practically all parts of the State from Alachua County south.

A DERMESTID (Thyrodrias contractus Mots.)

New York. E. Garlich (September 29): Larvae received from New York City. (Det. by W. H. Anderson.)

DRUG STORE WEEVIL (Stegobium raniceum L.)

New York. R. E. Horsey (October): Control measures were successful against this weevil in a local herbarium at Rochester, where considerable damage was done to specimens last year. Inspection of the specimens during the last 2 months revealed a few larvae. Adults capable of flight were found on September 30.

DRIED FRUIT BEETLE (Carpophilus hemipterus L.)

California and Arizona. P. Simmons and G. H. Kaloostian (October 11): Severe souring and decay of dates in the Indio, Phoenix, Yuma, and El Centro areas, caused by exceptional rains, was accompanied by an abundance of these beetles. This species was the most generally plentiful species found.

STORED GRAIN INSECTS

Minnesota. H. H. Shepard (October): Three recent records of Tribolium madens Chap. were noted, two of these being from residences in Murray County on August 31 and Lincoln County on October 17, and one from shelled corn in Yellow Medicine County on October 12. All three records are therefore from the southwestern corner of the State. On August 18 Callosobruchus maculatus F. was reported in large numbers in a kitchen cupboard in an apartment house at Saint Paul.

Indiana. J. J. Davis (October 5): The angoumois grain moth (Sitotroga cerealella Oliv.) is more prevalent and destructive this fall, especially in the southern half of the State, than for many years. Infestations refer primarily to field corn and popcorn.

Iowa. H. E. Jaques (October 23): The stored-grain situation is a serious one, much corn being already in sealed storage and an abnormally large crop in the field. A number of species of beetles and moths are involved.





THE INSECT PEST SURVEY  
BULLETIN

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BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING



DISTRIBUTION AND FOOD PLANT RECORDS OF Paratetranychus citri McG.,  
P. ilicis McG., P. pilosus C. & F., Tetranychus pacificus McG.,  
 and T. telarius L.

By Janet E. Mabry and Mary M. Walton

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INTRODUCTION

The following data have been compiled during the routine work of the Insect Pest Survey and to meet special requests for survey information. As all of the mites discussed are of economic importance, it is believed that a compilation of such data will be of value to workers in applied entomology. Any additions or corrections will be gladly accepted.

The names of counties are underscored, the word "county" being left out, and the names of foreign countries and provinces are written in all capital letters.

Paratetranychus citri McG.

Distribution in the United States

Alabama: In the Satsuma orange districts of southern Alabama and neighboring Gulf States.

California: Los Angeles, Claremont in eastern part of the county, San Fernando, San Fernando Valley; Orange, La Habra-Whittier area; Riverside, Riverside; Santa Barbara; San Bernardino, Upland-Cucamonga, Upland-Ontario district, Upland; San Diego, Chula Vista, Escondido, Lemon Grove, Rancho Santa Fe, San Diego; San Gabriel Valley; San Luis Obispo, San Luis Obispo; Ventura, Santa Paula. Note: "Has been observed in every citrus area in southern California."--E. A. McGregor.

Florida: Orange, Orlando. Infestation heavy over most of the State. Noted in the Peninsula in the western and southern parts.



Louisiana: Several heavy infestations have been found in the citrus-growing  
tion.

Mississippi: Jackson, Ocean Springs; Lamar, Lumberton; Lowndes, Columbus.

Texas: Rio Grande Valley; southeastern Texas.

#### Foreign Distribution

South America: BRAZIL, Minas Geraes; Vicosá.<sup>1/</sup> BERMUDA, CUBA. HAWAII:<sup>2/</sup> Present in every part of the Territory. Noted from Captain Cook to Napoopo  
Honolulu. JAPAN. NEW ZEALAND.

#### Host Plants

Anydalus persica, Brassica sp., Choisya sp., Citrus grandis, Citrus lin  
onia, Citrus nobilis var. unshiu, Citrus sinensis, Citrus trifoliata, Cucurbita  
pepo, Cytisus scopiarus, Dahlia sp., Echinocystis macrocarpa, Ipomoea purpurea,  
Juglans regia, Malus sylvestris, Malva parviflora, Rosa sp., Solanum sp., Tara-  
xacum sp., Urtica urens.

Paratetranychus ilicis McG.

#### Distribution in the United States

Alabama: Colbert, Spring Hill; Mobile, Mobile.

District of Columbia: Washington, Spring Valley.

California: Alameda, Berkeley; Contra Costa, south of Walnut Creek, San Ramon;  
Cucamonga, San Bernardino; Los Angeles, Inglewood, Los Angeles, Puente,  
San Fernando Valley, Whittier; Monterey, Gonzales, King City; Orange, An  
heim, Fullerton, Santa Ana; San Luis Obispo, Arroya Grande, San Luis  
Obispo; Santa Barbara, Santa Barbara, Santa Maria; Santa Clara, Palo Alt  
San Jose; Stanislaus, Turlock; Ventura, Santa Paula, Ventura.

Georgia: Spalding, Experiment, Griffin.

Michigan: Berrien; Kent; Van Buren; southwestern Michigan.

Ohio: Lake, Painesville.

South Carolina.

Virginia: Princess Anne, Cape Henry.

1/ There are two such places in Brazil. It is not known which one the reporter  
referred to.

2/ Biologically speaking, Hawaii is foreign.

Host Plants

Azalea indica, Camellia japonica, Cinnamomum camphora, Cornus florida,  
Cotoneaster sp., Cupressus sp., Cydonia sp., Eriobotrya japonica, Eucalyptus sp.,  
Eucalyptus globulus, Ilex opaca, Juglans sp., Juglans regia, Photinia arbuti-  
folia, Platanus occidentalis, Pyracantha coccinea, Pyracantha ummensis, Pyrus  
sp., Quercus nigra, Quercus phellos, Quercus virginiana, Quercus wislizensii,  
Rubus strigosus, Sonchus arvensis, Tsuga sp.

Paratetranychus pilosus C. & F.

Distribution in the United States

This species is somewhat general along the Atlantic coast from Nova Scotia to Virginia and west to Ontario, Michigan, and southern Indiana. It is found in the West from British Columbia south to central and southern California and east to southern Idaho and northern Utah.

California: Alameda, Oakland; Los Angeles, Hollywood, Los Angeles, North Whittier Heights, Venice, Whittier; Orange, Yorba Linda; San Joaquin, San Joaquin Valley; San Luis Obispo; Santa Barbara; Santa Clara; Tulare, Tulare; Ventura, Ventura; Yolo.

Connecticut: Fairfield, Danbury, Fairfield, Georgetown, Greenwich, New Canaan, Stamford, Wilton; Hartford, Bristol, Farmington, Glastonbury, Hartford, Southington, Unionville; Litchfield, Bantam; Middlesex, Branford, Cheshire, Clintonville, Guilford, Hamden, Madison, Milford, Mount Carmel, New Haven, North Branford, North Haven, Wallingford, Woodbridge; New London; Tolland, Storrs.

Delaware: Kent, Camden; New Castle, Newark; Sussex.

District of Columbia: Washington, east Petomac Park.

Idaho: Ada, Boise; Canyon; Cassia; Franklin; Gem; Gooding; Nez Perce, Lewiston; Oneida; Payette; Teton; Twin Falls, Twin Falls; Washington.

Illinois: Livingston.

Indiana: Knox, Vincennes; Marion, Indianapolis; Orange, Orleans.

Maine: Kennebec, Augusta; Oxford.

Maryland: Allegany, Cumberland, Lonaconing, Oldtown; Carolina, Denton; Harford, Havre de Grace; Prince Georges, Branchville, College Park; Talbot, Easton, Worcester, Berlin.

Massachusetts: Bristol; Connecticut Valley; Essex, Marblehead, West Newbury; Hamshire, Amherst; Middlesex, Lincoln; Norfolk, Atlantic; Plymouth, East Wareham, Brockton; Worcester, Harvard.



Michigan: Clinton, Saint Johns, near Fowler and Ovid; Ingham, East Lansing; Muskegon, Muskegon; Oakland, Birmingham, Novi, Rochester; Washtenaw.

Minnesota: Winona.

New Hampshire: Hillsboro, Wilton; Rockingham, Hampton Falls; Stafford, Durham.

New Jersey: Atlantic; Bergen; Burlington, Bridgeboro; Camden; Cape May; Cumberland; Essex; Gloucester; Hudson, south Jersey; Hunterdon; Mercer; Middlesex, New Brunswick; Monmouth, Manasquan; Morris; Salem; Sussex.

New York: Albany, Ravena; Broome, Binghamton; Cayuga; Chautauqua; Clinton; Columbia; Dutchess; Erie; Essex; Genesee; Green; Hudson Valley; Kings, Brooklyn; Monroe; Nassau; Niagara; Onondaga, Syracuse; Ontario, Geneva; Orange; Orleans; Oswego; Rensselaer; Rockland, Spring Valley; Saratoga; Schuyler; Seneca; Suffolk; Tompkins, Ithaca; Ulster; Wayne; Yates.

North Carolina: Haywood, Waynesville; Mitchell, Altapass; Watauga, Blowing Rock.

Ohio: Ashtabula; Clark, New Carlisle; Cuyahoga, Cleveland, subdivision of Bratenahl; Delaware; Erie, Sandusky; Fairfield; Franklin, Columbus; Huron, Norwalk; Lake, Willoughby; Lorain, Elyria; Lucas, Toledo, Waterville; Mahoning, Youngstown; Montgomery, Erie-Chautauqua; Ottawa, Catawba Island; Port Clinton; Sandusky, Clyde, Fremont; Trumbull, Hubbard; Wayne, Wooster.

Oregon: Benton, Corvallis.

Pennsylvania: Adams, Arendtsville; Centre, State College; Chester; Dauphin; Delaware; Luzerne; Lycoming; Montgomery, near Norristown; York, Delta.

Rhode Island: Noted in the State by A. E. Stone in 1924.

Utah: Cache, Logan, Providence; Davis; Salt Lake, Magna; Utah.

Vermont: Addison; Bennington, Dorset; Chittenden; Grand Isle; Orange, Bradford; Topsham; Rutland, Castleton; Washington, Waitsfield; Windham; Windsor.

Virginia: Augusta, Waynesboro; Fairfax, Oakton; Frederick.

Washington: Okanogan, Oroville; Walla Walla, Walla Walla Valley; Yakima, Yakima Valley.

West Virginia: Greenbrier, Lewisburg; Hampshire, Levels; Monongalia, Morgantown.

Wisconsin: Sauk.

#### Foreign Distribution

Canada: BRITISH COLUMBIA, Fraser Valley, Agassiz district; Yale, Kelowna, Okanagan, Summerland, Vernon. NOVA SCOTIA, Digby-Annapolis-Kings, Annapolis.



Royal, Morden, Wolfville; Halifax, Halifax; Kings; Annapolis Valley. NEW BRUNSWICK, Kent; Royal, Westfield; St. John-Albert, St. John River Valley; Victoria-Carleton, Coldstream; York-Sanbury, Fredericton, Sheffield. ONTARIO, Durham; Essex; Hastings, Trenton; Lambton, Forest; Lincoln, Vine-land; Niagara Peninsula; Welland, Fonthill; Wellington, Guelph to Fonthill Prairie Provinces: ALBERTA, MONTREAL; SASKATCHEWAN, QUEBEC.

Europe: BELGIUM. CZECHO-SLOVAKIA. DENMARK. ENGLAND, Berks, Twyford; Berkshire Buckingham; Cheshire; Cornwall; Devon, Brixham, Devon; Dorset, Gillingham; Gloucester, Bristol, Cambridge; Kent, East Malling, Marden; Lancashire, Preston; Monmouth; Monmouth; Norfolk; Northumberland, Rochester; Stafford, Stafford; Surrey, Wisely; Warwick, Stratford-on-Avon; Yorks, Bingley, Bishopthorpe. FINLAND, Helsinki. FRANCE. GERMANY, Lower Elbe; Alte Land district. HOLLAND, Zeeland. IRELAND, Dublin. ITALY. NORWAY. RUSSIA, Transcaucasus. SWEDEN. SWITZERLAND. WALES, North Wales; Mid-Wales; South Wales.

BERMUDA. JAPAN, Tokyo. AUSTRALIA, Tasmania. NEW ZEALAND, Palmerston North; Tiritea.

#### Host Plants

Acer sp., Amgdalus communis, Amgdalus persica, Amgdalus persica nectarina, Buxus sp., Crataegus sp., Ficus sp., Juglans regia, Magnolia sp., Malus sylvestris, Medicago sativa, Phlox sp., Pinus sp., Pittosporum sp., Prunus armeniaca, Prunus avium, Prunus cerasus, Prunus domestica, Prunus salicina, Pyrus communis, Quercus sp., Ribes vulgare, Rosa sp., Rubus strigosus, Salix sp., Sorbus sp., Thea sp., Tilia sp., Ulmus sp., Vitis sp., Zinnia sp.

Tetranychus pacificus McG.

#### Distribution in the United States

The Pacific red spider occurs from Portland, Oreg. to Delano, Calif., and probably farther south. Note: "I have observed this mite at many localities in the three Pacific coast States."—E. A. McGregor.

California: Fresno; Kern, Bakersfield, Delano; Los Angeles, Covina, Puente; Riverside, Riverside; Sacramento, lower Sacramento Valley, Sacramento Valley; San Joaquin, Acampo, Linden, Lodi, Manteca, San Joaquin Valley, Stockton; Stanislaus; Tulare; Tuolumne, Mt. Diablo, Stanislaus National Forest; Yolo, Knights Landing.

Idaho: Canyon, Parma; Cassia; Franklin; Nez Perce, Lewiston district; Oneida; Teton; Payette district; southwestern Idaho; southern part of State; northern part of State.

Oregon: Jackson, Talent; Multnomah, Portland; Portland to Delano, Calif.

Washington: Chelan, Azwell, Wenatchee Valley; Okanogan, Omak; Yakima, Grandview, Yakima Valley.

## Host Plants

Amygdalus persica, Apium graveolens, Asclepias sp., Capsella bursapast  
Castanea sp., Citrullus vulgaris, Citrus grandis, Cucurbita sp., Cucurbita sp.,  
Ficus sp., Gramineae, Ipomoea sp., Juglans sp., Juglans nigra, Malus sylvestris  
Malus sp., Medicago sativa, Melia azedarach, Phaseolus sp., Philadelphus sp.,  
Prunus racemosa, Prunus domestica, Prunus virginiana, Pyrus sp.,  
Quercus sp., Ribes sp., Robinia sp., Rubus parviflorus, Rubus sp., Rumex sp.,  
Salix sp., Solanum helongense, Vicia sp., Vitis sp., Viburnum sp.

Tetranychus telarius L.

This mite is nearly world wide in distribution. According to H. E. Ewing, "T. telarius is a serious pest in Europe and is generally distributed, except the northern part of Russia and in the Scandinavian Peninsula. In North America it is found from Ontario to Texas and from British Columbia to southern California. It is also known from South America, Hawaii, South Africa, and Australia. There appear to be no records of its occurrence in India, or in the Philippines (Jour. Ent. and Zool. Claremont, Calif., v. 6, No. 3, pp. 121-132, September 1914.) Other authors, however, report it from India.

Ewing considers T. telarius L., T. bimaculatus Harv., and T. gloveri Banks as synonymous. (Oreg. Agr. Expt. Sta. Bul. 121, 95 pp., August 1914; The Common Red Spider or Spider Mite, Rev. Appl. Ent. (A), v. 3, p. 63, 1915.) He no longer considers T. sexmaculatus Riley as a variety of T. telarius, but now regards it as a distinct species. He says, "The name T. bimaculatus Harv. cannot be used for this mite. The proper scientific name for it dates back many years before the days of Harvey. First a few years ago went over the matter again and decided upon T. telarius L. as the scientific name for the common spider mite of North America and Europe, which are without doubt identical. The question of a variational form does not apply in this case as has been claimed by some." (U. S. Natl. Mus. Let. Dec. 1, 1933.)

E. A. McGregor differs from the views of Ewing as to the synonymy of T. telarius L. He treats T. gloveri Banks as a synonym of T. bimaculatus. He says it is doubtful whether the true T. telarius occurs in North America at all. (The Red Spiders of America and a Few European Species Likely to be Introduced, U. S. Natl. Mus. Proc., v. 56, pp. 641-679, 1919.)

Throughout most of the volumes of the Review of Applied Entomology, T. telarius and T. althaeae are considered identical, but althaeae has at times been separated under the following genera: Epitettranychus, Paratetranychus, and Tetranychus.

This report includes records available in the Insect Pest Survey files and in the literature for T. telarius, T. bimaculatus and T. althaeae (Epitettranychus) (Paratetranychus), and T. gloveri.

E. A. McGregor, after reviewing this manuscript, made the following statements regarding T. telarius L. and its synonymy: "On a few occasions I have received identified material from Europe and it may be stated that T. telarius (as determined by Zacher) is entirely distinct from the common American 'red spider' going under that name. Speaking of the 'red spider' of linden trees in Europe,



acher says, 'This is the original species of red spider, which in 1766 was described as Acarus telarius by Linne and later, in the year 1832, was referred to the genus Tetranychus on account of the structure of the tarsus \* \* \* The linden mite is the smallest of the true Tetranychus species \* \* \* red-colored individual are rarely seen. The form designated as T. telarius by Ewing, Hirst, and others, hold to be T. althaeae von H.' Personally, I agree with Zacher in his conception of telarius. Like him, I believe that if our common 'red spider' of the United States is identical with an European species it is T. althaeae. The male genital characters of the latter agree quite well with those of our mite. Other characters of telarius as described by Zacher differ materially from those of the common American mite."

#### Distribution in the United States

Alabama: Baldwin, Fairhope; Barbour, Clavton; Chambers, Lafayette; Clark, Grove Hill; Coffee, Enterprise; Colbert, Tuscumbia; Elmore, Deatsville; Houston, Dothan; Lamar, Millport; Lawrence, Moulton; Lee, Auburn; Marshall, Guntersville; Montgomery, Montgomery; Perry, Marion; Pike, Troy; Tuscaloosa, Tuscaloosa; Walker, Carbon Hill.

Arizona: Cochise, Cochise; Maricopa, Mesa, Phoenix; Salt River Valley.

Arkansas: Craighead; Crittender; Cross; eastern counties; Faulkner; Lee; Miller; Mississippi; Monroe; northeastern Arkansas throughout the Delta; Phillips, Helena; Poinsett; Saint Francis.

California: Butte, Biggs, Chico; Calaveras; Colusa, Arbuckle; Fresno; Glenn; Kern, Bakersfield north to upper Sacramento Valley; Lake; Los Angeles, Chatsworth, Downey, Hawthorne, Inglewood, Los Angeles to Cucamonga, Montebello, Pomona, Rivera, San Fernando Valley, San Fernando, San Gabriel, Venice, Whittier; Madera; Merced; Orange; Riverside, Hemet, Riverside; Sacramento, Perkins, San Bernardino, Cucamonga, Redlands; San Diego, Chula Vista; Santa Clara, Mountain View; San Joaquin, San Joaquin Valley; San Luis Obispo; Shasta; Sutter; Tulare, Tulare, Visalia; Ventura; Yolo; Yuba, Wheatland. On walnut trees in all parts of the State.

Colorado: Arapahoe, Littleton; Arkansas Valley; Delta; Denver, Denver; eastern Colorado; Larimer, Fort Collins; Mesa, Grand Junction, Palisade; Montrose; northern Colorado; western Slope.

Connecticut: New Haven, Branford, Madison, North Haven.

Delaware: Sussex, Bridgeville, Nassau.

District of Columbia: Washington (greenhouse in 6th wing of U. S. Dept. Agr. Bldg.).

Florida: Alachua, Gainesville, La Crosse; Bradford, Starke; Charlotte, Punta Gorda; Dade, Miami; Duval, St. Nicholas; Jackson, Malone; Jefferson, Monticello; Lake, Eustis, Groveland, Leesburg, Yalaha; Madison, Madison; Monroe, Key Largo; Orange, Orlando; Polk, Galloway; Seminole, Sanford; Volusia, Pierson.



Georgia: Barrien; central Georgia; Cook; Dacatur, Bainbridge; Echols, Statesville; Franklin, Reyston; Hart; Johnson, Wrightsville; Lowndes, Valdosta; McIntosh; Macon, Marshallville; Madison; northern Georgia; Peach, Fort Valley; Richmond, Augusta; Spalding, Experiment, Griffin; Tift, Tifton; western mid-State section.

Idaho: Note from R. W. Haegeler: "In the Insect Pest Survey Bulletin dated August 1, 1937 (v. 17, No. 6, p. 284), is a report I sent in regarding common red spider, or the two-spotted mite. This note refers to both apple and prune. This fall I collected specimens of this mite from apple and sent them to E. A. McGregor for determination. He writes me that the mite is T. pacificus McG. This has been one of our common mite pests in the past and we have always called it the common red spider, or two-spotted mite. T. telarius L. may or may not occur here." Before this identification was made T. telarius was reported as generally distributed in all orchards of the State. (See E. A. McGregor's distribution map in U. S. Dept. Agr. Farmers' Bul. 831, p. 5, 1917.)

Illinois: Adams, Ursa; Alexander, Cairo; Bond; Carroll, Savanna; central Illinois; Champaign, Urbana; Clark; Cook, Chicago; Du Page, Lisle; Fulton, Canton; Grundy; Kane, Big Rock, Elgin; Kankakee; Knox, Galesburg; Lake, Libertyville; La Salle, Mendota; Lee, Paw Paw; Livingston; McLean, Bellflower; Ogle, Oregon, Rochelle; Scott, Winchester; Shelby, Strasburg; Saint Clair, Belleville; Tazewell, Pekin; Vermilion, Danville; White, Carmi; Will, Lockport.

Indiana: Boone, Janestown, Lebanon, Thorntown; central Indiana; Clinton, Frankfort; Dearborn, Aurora; De Kalb, Garrett; Delaware, Muncie; Dubois, Jasper; Elkhart, Elkhart; Fayette, Connersville; Floyd, New Albany; Franklin, Cedar Grove; Grant, Marion; Jackson, Brownstown; Jefferson, Hanover; Johnson, Greenwood; Knox, Vincennes; Kosciusko, Sidney, Warsaw; Lake, Hobart; La Porte, Michigan City; Madison, Anderson, Elwood, Orestes; Marion, Indianapolis; Marshall, Argos, Plymouth; Monroe, Bloomington; Montgomery, Linden; northern half of State; Ohio, Rising Sun; Porter, Valparaiso; Posey, Mount Vernon; Pulaski, Winamac; Putnam, Greencastle; Scott, Scottsburg; Shelby, Shelbyville; southwestern Indiana; Starke, North Judson; Steuben, Angola; Sullivan, Carlisle, Sullivan; Tippecanoe, La Fayette; Tipton, Goldsmith; Vanderburgh, Evansville; Vermilion, Clinton; Wabash, Wabash; Wayne, Dublin, Richmond.

Iowa: Southern Iowa.

Kansas: Arkansas River Valley district; Barber, Kiowa; Butler, Douglas; Clay, Wakefield; Comanche, Wilmore; Cowley; Crawford, Pittsburg; eastern half State; Ford, Dodge City; Graham, Hill City; Gray, Ingalls; Harper, Anthony; Harvey; Jackson; Kiowa; Logan, Monument; Kaw Valley; Leavenworth, Leavenworth; Marion, Tampa; Marshall, Blue Rapids; Neosho; northeastern Kansas; Pratt, Pratt; Reno, Haven, Hutchinson; Riley, Manhattan; Russell, Russell; Sedgewick; Sumner, Belle Plaine, Oxford; Washington, Clifton; Wilmore.

Kentucky: Bell, Pineville; the bluegrass region; Fayette, Lexington; Jefferson, Louisville; Perry, Hazard.

Louisiana: East Baton Rouge, Baton Rouge, University; East Louisiana; Livingston, Springfield; Madison, Tallulah; Orleans, New Orleans; Tangipahoa, Hammond, Ponchatoula.

Maine: Penobscot, Orono; southern Maine.

Maryland: Allegany; Anne Arundel; Baltimore, Towson; Caroline; Eastern Shore; Harford, Havre de Grace; Kent, Chestertown; Montgomery; Prince Georges, Beltsville; Somerset, Marion; Talbot, Easton; Washington; Wicomico; Worcester, Pocomoke, Showell.

Massachusetts: Bristol, Mansfield; eastern Massachusetts; Hampshire, Amherst; Middlesex, Arlington, Watertown, Woburn; Suffolk, market-garden district around Boston; Worcester, west Auburn.

Michigan: Berrien, Saint Joseph, Stevensville; Calhoun, Albion; Cass, Cassopolis, Hillsdale, Jonesville; Ingham, Lansing; Jackson, Jackson; Kent, Grand Rapids; Lenawee, Adrian; Macomb, Mount Clemens; Monroe, Monroe; Oakland, Farmington; Van Buren, Paw Paw, South Haven; Wayne, Detroit.

Minnesota: Jackson; throughout the State.

Mississippi: Adams, Natchez, Washington; Adams and adjoining counties; Alcorn, Corinth; Amite; Benton, Hickory Flats, Michigan City; Bolivar, Boyle, Cleveland, Pace, Rosedale, Scott; Calhoun, Calhoun City, Vardaman; Carroll, Carrollton; Chickasaw, Buena Vista, Houston; Choctaw, Ackerman; Claiborne, Hermanville; Clarke, Quitman; Clay, West Point; Coahoma, Clarksdale, Hillhouse, Lula; Copiah, Crystal Spring; Covington; Forrest, Hattiesburg; George, Lucedale; Greene, Leakeville, Vernal; Grenada, Grenada; Hancock, Bay Saint Louis; Harrison, Biloxi, Gulfport, Long Beach; Hinds, Bolton, Edwards, Raymond; Holmes, Cruger, Durant, Lexington, Tchula; Humphreys, Belzoni, Louise, Midnight; Issaquena; Itawamba; Jackson, Ocean Springs, Pascagoula, Pecan; Jasper, Moss Point; Jefferson, Fayette; Jefferson Davis, Prentiss; Jones, Laurel, Moselle; Kemper; Lafayette, Oxford; Lauderdale, Meridian; Lawrence; Lee, Baldwin, Guntown, Tupelo; Leflore, Minter City, Greenwood; Lincoln, Brookhaven; Lowndes, Caledonia, Columbus; Madison, Canton; Marshall, Byhalia, Holly Springs, Hudsonville, Potts Camp; Monroe, Aberdeen, Amory, Prairie, Smithville; Montgomery, Winona; Neshoba, Philadelphia; Newton, Union; Noxubee, Brookville, Shuqualak; Oktibbeha; Panola, Sardis; Pike, Magnolia, McComb; Pontotoc, Pontotoc; Prentiss, Booneville; Quitman, Marks; Scott; Sharkey, Catchings, Rolling Fork; Simpson; Smith; Stone, Perkinston, Perry, Wiggins; Sunflower, Baltzer, Blaine, Doddsville, Drew, Inverness, Sunflower; Tallahatchie, Charleston; Tate, Senatobia; Tishomingo, Iuka; Tunica, Maud, Tunica; Union, Ingomar, New Albany; Washington, Greenville, Hollandale, Stoneville; Wayne; Webster, Mantee; Wilkinson, Centreville; Winston, Louisville; Yalobusha, Coffeeville, Water Valley; Yazoo, Benton, Yazoo City.

Missouri: Atchison, Rockport; Buchanan, Saint Joseph; Franklin, Gerald; Jackson, Independence, Kansas City; Mississippi, Charleston; Nodaway, Maryville; northwestern Missouri; Pemiscot, Caruthersville; Ray, Hardin; Ripley, Doniphan; Saint Louis, Shaw Gardens, Saint Louis; Shelby, Clarence; southeastern Missouri; southwestern Missouri.



- Montana: Beaverhead, Wisdom; Cascade, Great Falls; Fergus, Moore; Flathead, Somers; Gallatin, Bozeman; Lake, Flathead; Lincoln, Fortine; Ravalli, 4
- Nebraska: Adams; Antelope; Buffalo; Cass; Chase; Cheyenne; Clay; Cuming; Custer; Antelope Valley; Dawes; Dawson; Dodge; Douglas, west to Nance, north to Cumings, and south to Johnson Counties; Dundy; eastern counties; Gage; Garfield; Hamilton; Hays; Koith; Lancaster, Lincoln; Morrill; Nance; Nuckolls; Otoe; Pawnee; Perkins; Phelps; Platte; Redwillow; Saline; Seward; Sheridan; Sioux; Thayer; Valley; Wayne; Webster; western Nebraska.
- Nevada: Mineral, Mina; Washoe, Reno.
- New Hampshire: No specific records.
- New Jersey: Middlesex, Monmouth Junction; throughout the State.
- New Mexico: Torrance, Estacia Valley; Valencia.
- New York: Albany, Albany; Broome, Deposit; Delaware; Cattaraugus, Delevan; Chautauqua; Columbia; Dutchess; Erie, Brant, Buffalo; North Collins; Essex; Jefferson, Adams; Kings, Brooklyn; Monroe, Highland Park, Rochester; Nassau, Glen Cove, Hempstead, Manhasset, Old Westbury; New York, New York City; Niagara; northwestern New York, Genesee Valley; Oneida, Utica; Ontario; Orleans; Queens, Springfield Gardens; Rockland; Suffolk, Bellport; Riverhead; Tompkins, Ithaca; Ulster, Kingston; Wayne; western New York.
- North Carolina: Alamance, Alamance; Anson; Beaufort, Martin; Bertie; Bladen, Dublin; Brunswick; Buncombe, Grantville; Burke; Cabarrus, Cabarrus; Caldwell, Lenoir; Carteret; Columbus, Chadbourn; Craven, Warran; Cumberland, Cumberland; Durham, Durham; Gaston, Stanley; Granville, Catham; Guilford, Guilford; Halifax, Halifax; Harnett, Harnett; Hertford, Union; Hoke; Iredell; Johnston; Lee; Lincoln; Macon, Franklin; McDowell, Pitts; Mecklenburg, Davidson; Mitchell, Vance; Montgomery; Moore; Nash; New Hanover; Wilmington; Northampton; Pender, Edgecombe; Perquimans, Hertford; Pitt; Randolph; Polk, Columbus; Robeson; Rockingham, Leaksville; Rowan, Cleveland, Rowan; Sampson, Orange; Scotland; Wake; Washington, Hoke; Wayne; Wilson.
- North Dakota: Kidder, Steele; counties along the Red River Valley.
- Ohio: Allen, Elida, Lima; Ashland, Ashland; Ashtabula, Ashtabula; central Ohio Clark, New Carlisle, Springfield; Guyahoga, Cleveland, Dover, Rocky River; Erie, Milan; Fairfield, Carroll, Lithopolis; Franklin, Briggsdale, Columbus, East Columbus; Guernsey, Cambridge; Hamilton, Blue Ash; Jackson, Wellston; Lake, Mentor, Painesville; Loraine, Elyria; Lucas, Toledo; Mahoning, Youngstown; Medina, Medina, Wadsworth; Montgomery, Dayton; northern Ohio; Pike, Elm Grove; Portage, Randolph, Ravenna; Sandusky, Clyde; Shell Anna; southern Ohio; Stark, Canton, Waynesburg, Wilmot; Summit, Akron, Barberton; Washington, Marietta; Wayne, Rittman, Wooster; western Ohio; Wyandot, Upper Sandusky.
- Oklahoma: Creek, Drumright; central Oklahoma; Dewey, Seiling; Oklahoma, Britton; Oklahoma City; Stephens, Duncan; all parts of Oklahoma.



- Oregon: Benton, Corvallis; Douglas; Hood River; Jackson, Medford, Talent; Josephine, Grants Pass; Malheur, Ontario; Marion, Salem; Rogue River Valley; Umatilla, Freewater, Milton; Washington, Forest Grove; Willamette Valley.
- Pennsylvania: Adams; Chester, Kennett Square; Lackawanna, Roaring Brook Township; Philadelphia, Philadelphia.
- South Carolina: Allendale, Fairfax; Barnwell; Coastal Plains Section; central Plains Section; Darlington; Florence; Greenville, Piedmont; Lexington, Leesville; Marlboro; Orangetburg, Springfield; Richland, Columbia; Saluda, Batesburg; Sumter.
- South Dakota: Throughout the entire State.
- Tennessee: Davidson, Nashville, Woodbine; Fayette, Moscow; Lawrence, Appleton; Shelby, Memphis; general over the State.
- Texas: Brazos, College Station; Calhoun, Port Lavaca; Cameron, Brownsville; Dallas, Dallas; Galveston, Dickinson; Hill, Hillsboro; Nueces, Robstown; Sutton, Sanora.
- Utah: Box Elder, Brigham, Willard; Cache, Hyrum, Logan, Providence, Trenton; Davis, Bountiful, Centerville, Farmington; Emery, Castle Dale; Garfield, Cannonville; Grand, Moab; Iron; Salt Lake, Union; Salt Lake Valley; San Juan; Utah, Lindon, Pleasant Grove, Provo; Washington, Santa Clara; Weber, Ogden.
- Vermont: No references to Vermont were found but E. A. McGregor has one locality on his distribution map for Tetranychus telarius L. (See U. S. Dept. Agr. Farmers' Bul. 831, p. 5, 1917, 1934.)
- Virginia: Accomac, near Nelsonia, Onley; Arlington, Arlington; Augusta, Staunton; Campbell, Lynchburg; Eastern Shore district; Fairfax, Oakton; Nansemond, Whaleyville; Norfolk, Norfolk; Princess Anne; southeastern Virginia.
- Washington: Chelan, Wenatchee; Grant, Marlin, Warden; King, Seattle; Mason, Shelton; northwestern Washington; Okanogan, Okanogan; Walla Walla; Whitman, Lacrosse; Yakima, Moxee City, Yakima.
- West Virginia: Lewis, Weston; Monongalia, Morgantown.
- Wisconsin: Dane, Madison; Jefferson, Waterloo; Lincoln, Gleason; Monroe, Warrens; southern Wisconsin; throughout the State.
- Wyoming: Central part of the State.

#### Foreign Distribution

Canada: ALBERTA, Calgary, Calgary, West; Lethbridge, Barnwell, Coaldale, Lethbridge, New Dayton, Raymond, Taber; Macleod, Macleod, Pincher Creek; Medicine, Brooks, Medicine Hat, Strathmore; Peace River, Wembley; Red Deer, Olds; throughout Alberta. BRITISH COLUMBIA, Cariboo, Pouce Coupe; Fraser

Valley, Sardis; Kamloops, Salmon Arm; Nanaimo, Sidney; Okanagan Valley; Okanagan Centre; Sumas Prairie; Yale, Vernon. MANITOBA, Brandon; MacDon Rossendale, Stockton, Wawanesa; Noepawa, Anarant, Carberry, Douglas, Gl stone, Neepawa; Portage la Prairie, Portage la Prairie; Prairie Province Saint Boniface, Winnipeg; Winnipegosis, Swan River, to the international boundary; widespread in Manitoba. NEW BRUNSWICK, Saint John River Valle NOVA SCOTIA, Kings, Annapolis Valley. ONTARIO, Algona, Sudbury; Essex, Leamington; Lincoln, Beamsville, Niagara, Stoney Creek, Vineland, Winona Norfolk, Simcoe, Waterford; Port Arthur, Thunder Bay; Prescott, Fournier Russell, Ottawa; Wentworth, Burlington. York, Toronto; widespread in Ont. north of Lake Huron and Lake Superior. QUEBEC, Wright, Aylmar. SASKATCHEWAN, Assiniboia, Estevan (district southwest of); Battlefords, Scott; Me fort, Melfort; Moose Jaw, Pitman; Prince Albert, Parkside; Qu'Appelle, Indian Head; Rosthern, Saskatoon; Swift Current, Swift Current; throughout Saskatchewan.

Central America: COSTA RICA, San Pedro de Montes de Oca. MEXICO, State of Mor los; district of Huautla; State of Yucatan.

South America: ARGENTINA. BRAZIL, Bahia; Pernambuca; Vicasia; Minas Geraes; R de Janeiro.

Europe: AUSTRIA, Vienna. BELGIUM. BULGARIA. CZECHOSLOVAKIA. DENMARK, Copen hagen. ENGLAND, Bedford, Sandy; Barks, Kingston, Baguize, Sonning, Twyf Buckingham, Amersham; Cambridge; Cheshire; Conway Valley; Cornwall, Pen zance; Cumberland, Skelton, Warwick; Derby, Derby; Devon, Bere Alston, Da lish, Elburton, Paignton, South Devon, Tavistock; Gloucester, Bristol, Ca bridge, Cheltenham; Hampshire, Botley, Fareham, Petersfield; Hereford, We ington; Huntingdon, Patton; Kent, Beltring, Canterbury, Chiselhurst, Cool ing, Dartford, Goudhurst, Herts, Knockholt, Maidstone, Malling, Marden, Priory Station, West Mallin, West Peckham, Wye, Yalding; Lincoln, Middle sex, Hampton; Monmouth, Abergavenny, Blackwood, Chepstow, Dinham, Newport South Monmouthshire, Usk; Northumberland, Blyden Hall, Corbridge, Cumber land; Nottingham; Oxford, Stanton Harcourt; Shropshire, Bedstone, Cound, Ellesmere, Leaton, Shrewsbury; Somerset, Bath; Stafford, Burton-on-Trent, Standon; Surrey, Byfleet, Wisley; Sussex, Wadhurst; southeastern England; southern England; southwestern Provinces; Warwick, Alcester, Moreton; Wil Stourton; Worcester, Malvern, Pershore; York, Boston Spa, Bridlington, Bruntcliffe, Denholme, Ellerton, Goathland, Goole, Halifax, Leeds, North Cave, Nostell, Rawdon, Sheffield, Tadcaster, Wakefield; Wales. FINLAND. FRANCE, Alsace; Cote-d'Or; Mentone; Montpellier; Paris; southern France, Strasburg, Toulouse. GERMANY, Augustenberg; Saxony, Bautzen. HOLLAND, r corded constantly as a pest; Zeeland. HUNGARY. IRELAND. ITALY, Redmon Salerno Prov.; Turin; all citrus sections. LATVIA. NORWAY, Christiana. POLAND. RUMANIA, Bessarabia. RUSSIA, Armenia, Nakhichevan; Astrakhan; Caucasus, Anapa district on the Black Sea; Taman Peninsula of the Kuban region; central Russia; Crimea; Kazanstan (south part); Leningrad region; Moscow; Orel; Tadzhkistan; Transcaucasia; Ukraine, Kharkov, Kherson, Odessa, Volhynia; Uzbekistan. SICILY, Catania Province; Messina Province Palermo; district of South Agata di Militello. SPAIN, Ciudad Real; all o the citrus-growing sections. SWEDEN. WALES, Cardigan, Aberystwyth; Flin St. Asaph; Glamorgan, Barry, Cardiff, Cardigan, Fonmon, Neath, Oxwich,



Pontardawe, Rhosé, Swansea; Merioneth; Pembroke, Dale. YUGOSLAVIA.

West Indies: Antigua Isl.; Bahama Isl.; Bermuda Isl.; Barbados Isl.; Cuba Isl.; Haiti Republic, Port-au Prince, Cul-de-Sac; Jamaica Isl.; Nevis Isl.; Puerto Rico Isl., Bayamon; St. Lucia Isl.; St. Vincent Isl.; Trinidad Isl. Virgin Isles, St. Croix.

Dutch East Indies: Java, Buitenzorg.

Indian Ocean: Mauritius; Reunion Isl.; Saint Denis.

Pacific Ocean: Hawaiian Isl.\*, the lower Pulehu section.

Australia: NEW SOUTH WALES, Sydney; QUEENSLAND; southeastern Australia; TASMANIA  
Launceston, Victoria.

#### Host Plants

Abutilon sp., Acacia sp., Acer dasycarpum, Acer rubrum, Acer saccharum, Adopogon dandelion, Aesculus hippocastanum, Aethionema sp., Agropyrum repens, Albizzia sp., Allium cepa, Alnus sp., Alnus japonica, Althaea officinalis, Althaea rosea, Amaranthus blitoides, Amaranthus retroflexus, Ampelopsis quinquefolia, Amygdalus communis, Amygdalus persica, Amygdalus persica nectarina, Ananas sativus, Angelica sp., Arthionema sp., Antirrhinum sp., Apios tuberosa, Apium graveolens, Apocynum sibiricum, Aquilegia sp., Arachis hypogaea, Arctium lappa, Aristolochia siphon, Arthemisia vulgaris, Arum sp., Asclepias syriaca, Asparagus plumosus, Aspidistra sp., Aster sp., Aucuba sp., Avena sativa, Azalea sp., Balsam, Bauhinia sp., Begonia sp., Berberis thunbergii, Berlandiera subacaulis, Beta cicla, Beta crassa, Beta vulgaris, Betula sp., Bouvardia sp., Brassica oleracea capitata, Brassica rapa, Buddleia sp., Buxus sp., Cactaceae, Calceolaria sp., Calonyction, Camellia japonica, Canavalia sp., Cannabis sativa, Capsicum annuum, Carica papaya, Carpheophorus corymbosus, Cedrus deodara, Cedrus sp., Celastrus sp., Celtis occidentalis, Chamaesyce buxifolia, Chayota edulis, Chenopodium album, Chenopodium ambrosioides, Chenopodium botrys, Chrysanthemum parthenium, Chrysanthemum sp., Cinchona sp., Cinnamomum camphora, Citrullus vulgaris, Citrus grandis, Citrus medic, Citrus nobilis, Citrus nobilis deliciosa, Citrus nobilis unshiu, Citrus sinensis, Clematis jackmani, Clematis sp., Clitoria sp., Cnicus benedictus, Codiaeum variegatum, Coffea arabica, Colocasia sp., Convallaria majalis, Convolvulus arvensis, Convolvulus sp., Corylus avellana, Cotoneaster sp., Crassula sp., Crataegus sp., Crotalaria purshii, Crotalaria rotundifolia, Cucumis melo, Cucumis sativus, Cucumis sp., Cucurbita maxima, Cucurbita pepo, Cuphea sp., Cupressus arizonicus, Cupressus sempervirens, Cupressus sp., Cyclamen sp., Cydonia oblonga, Cypripedium sp., Dactylis glomerata, Dahlia sp., Datura arborea, Datura metel, Datura stramonium, Datura suaveolens, Datura sp., Delphinium sp., Desmodium tortuosum, Dianthus carvophyllus, Diervilla sp., Digitalis purpurea, Disella hederacea, Dolichos spp., Dracaena sp., Elaeagnus pungens, Eriobotrya japonica, Erlangea moschatum, Eryngium aromaticum, Erythrina sp., Euonymus atropurpureus, Eupatorium compositifolium, Faba vulgaris, Ficus sp., Fragaria sp., Fraxinus americana, Fraxinus sp., Fuchsia spp., Gardenia sp., Geranium carolinianum, Geranium maculatum, Geranium sp., Gladiolus sp., Gleditsia sp., Gnaphalium obtusifolium, Godetia sp., Gossypium hirsutum, Gossypium sp., Gramineae, Gymnocladus canadensis, Gymnocladus sp., Hardenbergia comptoniana, Hedera helix hort. var., Hedera helix, Helianthus annuus,

\*Biologically foreign.



Helianthus lenticularis, Heliotropium sp., Heracleum sp., Heterotheca subaxill  
Hevea sp., Hibiscus esculentus, Hicoria pecan, Hoffmannia griesbreghtii, Hordeu  
vulgare, Humulus lupulus, Humulus sp., Hydrangea sp., Ipomoea batatas, Ipomoea  
purpurea, Iris sp., Juglans nigra, Juglans regia, Juniperus excelsa, Juniperus s  
Juniperus virginiana, Laburnum sp., Lactuca sativa, Lactuca scariola, Lagerstro  
indica, Lantana sp., Larix sp. Lathyrus odorata, Leonotis nepetaefolia, Ligust  
amurense, Ligustrum sp., Lilium longiflorum, Linum sp., Lippia nodiflora, Lonic  
sp., Lupinus sp., Lycopersicum esculentum, Lycopersicum sp., Melura pomifera,  
Malus sylvestris, Malva parviflora, Manettia sp., Mangifera indica, Manihot esc  
lenta, Medicago hispida, Medicago sativa, Melia sp., Mimulus moschatus, Mimulus  
sp., Morus sp., Oenothera laciniata, Oenothera sp., Orthrosenthus sp., Passiflo  
spp., Pastinaca sativa, Pelargonium sp., Persea gratissima, Persicaria lapathif  
Phaseolus acutifolius var. latifolius, Phaseolus lunatus macrocarpus, Phaseolus  
multiflorus, Phaseolus spp., Phaseolus vulgaris, Phlox sp., Physalis angulata v  
linkina, Physalis edulis, Phytolacca americana, Picea canadensis albertiana, Pi  
canadensis, Picea excelsa, Picea pungens, Picea pungens glauca, Picea sp., Pinu  
banksiana, Pinus strobus, Piper sp., Pisum sativum, Platanus sp., Polyanthus sp.  
Populus balsamifera, Populus candicans, Populus nigra italica, Populus sp., Pop  
us tremuloides, Populus trifoliata, Primula sp., Prunus armeniaca, Prunus aviun  
Prunus cerasus, Prunus domestica, Prunus spp., Pseudotsuga douglasi, Ptelea tri  
iata, Pueraria thunbergiana, Pycnothymus rigidus, Pyracantha sp., Pyrus comuni  
Quamoclit pinnata, Quercus alba, Quercus nigra, Quercus palustris, Quercus phel  
Raphanus sativus, Reseda sp., Ribes grossularia, Ribes nigrum, Ribes rubrum, Ri  
vulgare, Ricinus communis, Robinia pseudacacia, Rosa indica, Rosa spp., Rubus  
allegheniensis, Rubus occidentalis, Rubus strigosus, Rubus spp., Rudbeckia laci  
ata, Rumex acetosella, Rumex sp., Salix babylonica, Salix lasiandra, Salix sp.,  
Salvia sp., Sambucus sp., Sassafras sp., Scabiosa sp., Selenicereus sp., Sesban  
aegyptiaca, Sida rhombifolia, Sisymbrium officinalis, Smilax sp., Soja max, Sol  
gracilis, Solanum melongena, Solanum muricatum, Solanum sp., Solanum tuberosum,  
Solidago sp., Sonchus arvensis, Sonchus asper, Sorbus sp., Spinacia oleracea,  
Spiraea tomentosa, Stachys arvensis, Sterculia acerifolia, Syringa sp., Tagetes  
Taraxacum sp., Taxus sp., Thea sp., Thuja orientalis, Thuja sp., Thunbergia sp.,  
Thyransanthea semiflosculare, Tilia platyphyllos, Tradescantia fluminensis, Tr  
folium incarnatum, Trifolium pratense, Triticum aestivum, Tropaeolum peregrinum  
Tropaeolum sp., Typha sp., Ulmus sp., Verbena sp., Vernonia sp., Veronica sp.,  
Viburnum sp., Vicia angustifolia, Vicia faba, Vicia sativa, Vicia sp., Vicia  
villosa, Vigna spp., Viguiera sp., Viola odorata, Viola spp., Viola tricolor,  
Vitis spp., Weigela sp., Wisteria sp., Xanthium sp., Zantedeschia sp., Zea mays,  
Zinnia sp.

DATE RECEIVED: 01/01/2001 10:00 AM

December 15, 1939

BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING





## STATUS OF THE EUROPEAN CORN BORER IN 1939

A. M. Vance, Entomologist  
Bureau of Entomology and Plant Quarantine  
United States Department of Agriculture 1/

## Distribution

The territory in northeastern United States known to be infested by the European corn borer (Pyrausta nubilalis Hbn.) was extended in 1939 to include Cook, Du Page, Kankakee, Lake, and Will Counties in Illinois; Camden, Currituck, and Pasquotank Counties in North Carolina; Kent and New Castle Counties in Delaware; Chester, Delaware, Lancaster, and Montgomery Counties in Pennsylvania; Dodge, Green Lake, Jefferson, Oconto, Outagamie, Shawano, and Waupaca Counties in Wisconsin; and Lancaster, Nansemond, and Richmond Counties in Virginia.

## Fall Abundance

An extensive survey to determine the relative abundance of the European corn borer in corn over the greater part of the territory infested by the insect was conducted in the fall of 1939 by the Bureau of Entomology and Plant Quarantine in cooperation with interested States. The survey procedure utilized by the Bureau in 1939 was somewhat modified from that of previous years, the change resulting in an increase in the size of the area that could be examined without

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The information presented in this report was assembled at Toledo, Ohio, as a phase of European corn borer research, with W. A. Baker in charge. All data on abundance of the corn borer in the fall of 1939 in Indiana (35 counties), Maine (13 counties), and New Jersey (19 counties) were collected by the State Conservation Department of Indiana and the State Departments of Agriculture of Maine and New Jersey, respectively. The Agricultural Experiment Station at Geneva, N. Y., surveyed 10 counties in eastern New York, the Vermont Department of Agriculture surveyed 10 counties in the northern half of Vermont, and the New Hampshire Agricultural Experiment Station surveyed 5 counties in eastern New Hampshire. Some assistance in the field work was also given by the agricultural experiment stations of Delaware, Maryland, and Massachusetts in their respective States. First records of the European corn borer in Illinois were contributed by the Natural History Survey and State Department of Agriculture of Illinois, and in North Carolina by the State Department of Agriculture, and new county records of the insect within States already infested were furnished by the State Departments of Agriculture of Pennsylvania, Virginia, and Wisconsin. The Bureau of Entomology and Plant Quarantine is appreciative of the interest and cooperation of all States in which the survey was conducted or from which records of distribution were obtained in 1939.

serious sacrifice in the adequateness of the data obtained. With the exception of the counties surveyed in Indiana and Maine, 10 cornfields distributed at random were examined in each county included in the program, the sampling in each field consisting of a count of infestation in 25 consecutive plants taken a short distance into the field from near the middle of its most accessible edge, and the dissection of the first 2 plants found infested to determine the number of borers per infested plant. In Indiana and Maine, where an average of 20 to 25 cornfields were taken at random within each county, the population figure for each field was based on the examination of 100 plants (25 consecutive plants in the approximate center of each quarter of the field) and the dissection of either 5 or 10 infested plants. In either procedure, the product of the percentage of plant infestation in a field and the average number of borers per infested plant provided a figure designated as the average number of borers per 100 plants. The population averages derived in this way for the individual fields were then grouped in the calculation of county averages.

In the 1939 survey a total of 3,489 cornfields were examined in 285 counties of 16 States infested by the European corn borer. Two small counties were combined in each of 2 States and each pair treated as a single county. The number of counties surveyed and the resultant average number of borers per 100 plants in each State, and in the entire area, are given in table 1. In an alphabetical arrangement by States and the counties surveyed within each of them, the data on average number of borers per 100 plants in 1939 are presented in table 2, together with comparable figures obtained in 1938 and in certain other years when more or less extensive surveys were conducted by the Bureau. Definite comparisons of the abundance of the corn borer in 1939 and 1938 are possible only for those counties or county groups surveyed in these 2 years, and on this basis the status of the insect in 1939, as compared with 1938, is shown on map 1. The relative abundance of the corn borer over the entire area surveyed in 1939 is illustrated on map 2. In reading the data given in the tables it should be noted that a zero recorded for any county merely indicates a population so low that no infested plants occurred within the counts made and does not mean the complete absence of the borer. The following discussion summarizes the more important features of the survey data.

The greatest abundance of the European corn borer in the United States in the fall of 1939 was found in southern New England, where 5 counties in eastern Massachusetts, 2 in central and 2 in eastern Connecticut, and 4 in Rhode Island averaged 501-900 borers per 100 plants, and in the tip of the "thumb" section of Michigan, where 1 county had a borer population of this size. Populations of 101-500 borers per 100 plants appeared in 4 counties in central and 1 in southeastern Massachusetts, 2 in western and 2 in central Connecticut, 2 in southeastern New Hampshire, 1 in southeastern and 2 in northwestern Vermont, 1 in western and 5 in eastern New York and 2 on Long Island, 3 in northeastern and 1 in central New Jersey, 1 in southeastern Pennsylvania, 1 in northeastern and 14 in northwestern Ohio, 5 in eastern Indiana, and 15 in southeastern Michigan. In the remainder of the territory surveyed in 1939, comprising 209 of the 285 counties covered, the average number of borers per 100 plants in a county was not over 100.

Indiana.—A highly significant increase in abundance of the corn borer in 1939 over 1938 occurred in the region of 35 counties surveyed in both years in Indiana, where the average number of borers per 100 plants more than doubled from 14.9 in 1938 to 34.1 in 1939. Significant increases took place in 22 of the in-



dividual counties, whereas in each of the other 13 the population of the insect showed no significant change in these 2 years. The heaviest concentration of the borer in Indiana in 1939 was found in a group of 5 counties near the eastern border of the State, namely, Adams, Wells, Allen, Jay, and Blackford, in which the numbers of borers per 100 plants were, respectively, 177.0, 151.2, 147.9, 127.7, and 106.4. Less than 91 borers per 100 plants were present in each of the remaining 30 counties surveyed in Indiana.

Ohio.---In Ohio comparisons of borer infestation in 1938 and 1939 are available for 12 counties in the extreme northwestern part of the State. In this section, as a whole, the average of 108.7 borers per 100 plants in 1939 was not significantly different from that of 133 in 1938. In none of the 12 counties was there a significant increase in number of borers from 1938 to 1939; in 8 of them the populations of the insect for these 2 years remained at about the same level, and in 4 a definite decrease occurred from 1938 to 1939. Van Wert County, with 374.8 borers per 100 plants, had the highest infestation of any county surveyed in Ohio in 1939. The next 3 highest counties in the State were Marion, Putnam, and Auglaize, with populations of 278.6, 211.6, and 201.4 borers per 100 plants, respectively. Only 10 other counties in northwestern and 1 in northeastern Ohio averaged over 100 borers per 100 plants in 1939, populations below this level occurring in each of the other 44 counties surveyed in the State. Abundance of the corn borer was relatively low (averaging less than 67 borers per 100 plants) in 30 counties surveyed in the eastern half of the State where high infestation has never been recorded since the introduction and spread of the insect over the area.

Michigan.---Among 6 counties of southeastern Michigan whose data are comparable for 1938 and 1939, there were 2 counties in which populations of the corn borer increased significantly in 1939 over 1938, 3 in which there was no change, and 1 in which the abundance of the insect decreased from 1938 to 1939. The net result in this section was a significant increase from 122.7 borers per 100 plants in 1938 to 162.0 in 1939. Huron County, at the extreme tip of the "thumb" section of Michigan, with its average of 595 borers per 100 plants, exceeded all other counties in the State in 1939 and was the heaviest infested county outside of New England. Four other counties in eastern Michigan--Genesee, Tuscola, Lapeer, and Ingham--had high populations of 447.0, 416.4, 376.2, and 347.0 borers per 100 plants, respectively, and 11 other counties in the State averaged between 101 and 300 borers per 100 plants. Each of the remaining 15 counties surveyed in Michigan averaged less than 100 borers per 100 plants.

Pennsylvania.---Corn borer infestation was relatively light in 5 counties in northwestern and 14 in northeastern Pennsylvania surveyed in 1939. Bucks County, on the eastern border of the State, with 142 borers per 100 plants, was the only county in Pennsylvania in which the average number of borers per 100 plants was greater than 23.

New York.---With the exception of 6 counties in New York State proper and 2 on Long Island, populations of the corn borer in the 48 counties surveyed in that State in 1939 were relatively light (less than 95 borers per 100 plants). Niagara County, with 227 borers per 100 plants, was the only high county in the western part of New York. In eastern New York, Albany County had 491.4 borers per 100 plants, and the counties of Nassau, Suffolk, Otsego, Renesselaer, Columbia, and Fulton were infested with 251.8, 191.2, 177.0, 160.4, 139.8, and 101.8 borers per



100 plants, respectively. The general level of population in the county group of Chautauqua-Erie-Niagara was about the same in 1939 as in 1938, while in the combined counties of Jefferson and Oswego there was a decrease in 1939 from 1938.

Vermont, New Hampshire, and Maine.---In Vermont, Windham County in the southeastern corner of the State, with 142.8 borers per 100 plants, and Chittenden and Grand Isle Counties in the northwestern part, with 117.6 and 106.0 borers per 100 plants, respectively, were the only counties of the 14 surveyed in the State in 1939 which averaged over 94 borers per 100 plants. In New Hampshire, Rockingham and Hillsboro Counties in the southeastern part of the State had respective populations of 148.8 and 103.4 borers per 100 plants, whereas each of the other 7 counties surveyed in the State averaged less than 44 borers per 100 plants. Borer abundance in all of the 13 counties surveyed in Maine in 1939 was relatively light, averaging over 5 borers per 100 plants in only York and Lincoln Counties, in which 72.9 and 50.6 borers per 100 plants, respectively, were found.

Massachusetts, Rhode Island, and Connecticut.---In Massachusetts in 1939 the 7 counties of Middlesex, Barnstable, Essex, Norfolk, Bristol, Plymouth, and Hampden averaged 860.8, 774.8, 770.4, 585.0, 573.6, 391.0, and 387.0 borers per 100 plants, respectively. Three of the remaining counties in the State had from 101 to 300 borers per 100 plants, but Berkshire County was low, with only 4.8 borers per 100 plants. Populations of the borer in all 4 counties of Rhode Island were high in 1939, ranging from 504.4 borers per 100 plants in Washington to 859.6 in Bristol-Newport County. In Connecticut, New London County, with 807.2 borers per 100 plants, was followed by Windham, Hartford, New Haven, Middlesex, Tolland, Fairfield, and Litchfield Counties, with 523.0, 520.4, 503.2, 425.4, 366.8, 321.4, and 300.2 borers per 100 plants, respectively. The corn borer was significantly lower in abundance in Hartford and New Haven Counties in 1939 than in 1938.

New Jersey.---Generally reduced abundance of the corn borer in 1939 from 1938 appeared in Burlington, Mercer, and Monmouth Counties, although individual cornfields that carried very high populations of the insect could be found in this section in 1939. No significant change occurred in the status of the borer in Middlesex County and in the county group of Camden and Gloucester between 1938 and 1939. Populations averaging over 100 borers per 100 plants in 1939 were noted in Bergen, Burlington, Middlesex, and Essex-Union Counties of New Jersey, with 292.8, 220.8, 211.0, and 147.2 borers per 100 plants, respectively. In the remaining 15 counties of the State fewer than 100 borers per 100 plants were found.

Delaware, Maryland, and Virginia.---Infestation by the corn borer in 1939 was found in all 3 counties of Delaware, with relatively low populations of 11.4, 11.2, and 4.0 borers per 100 plants in Sussex, Kent, and New Castle Counties, respectively. Sussex County in Delaware had approximately the same number of borers in 1939 as in 1938. In the combined counties of Wicomico and Worcester in Maryland the level of corn borer abundance changed little from 1938 to 1939. The 1939 survey showed 11.4, 4.8, and 1.2 borers per 100 plants in Worcester, Wicomico, and Somerset Counties, respectively. There was a significant increase in corn borer abundance in 1939 over 1938 on the Eastern Shore of Virginia, where Northampton County in 1939 averaged 54.8 and Accomac 28.0 borers per 100 plants.

## Abundance in Sweet Corn and White Potatoes

Special surveys of abundance of the first generation of the European corn borer in early market sweet corn and in white potatoes were conducted in several localities in the summer of 1939.<sup>2/</sup> In the case of sweet corn the surveyed field represented those most heavily infested within a given locality. Fields of potatoes were surveyed at random. The data on sweet corn are given in table 3.

Infestation of the European corn borer in early market sweet corn in 1939 was most severe in New Haven County, Conn., where half of the fields surveyed averaged 20 or more borers per 100 plants, and in Ulster County, N. Y., where the same proportion of fields averaged 10 or more borers per 100 plants. In New Haven County the average number of borers per 100 plants was 1,980 and in Ulster County 1,264. The greatest increase of the pest in sweet corn occurred in Burlington County, N. J., where an average of 50 borers per 100 plants in 1938 changed to 417 in 1939. Less than half as many borers infested the crop in Lucas County, Ohio, in 1939, when the average number per 100 plants was 817, as in 1938 when it was 1,750. The heaviest population in early market sweet corn in any of the 4 counties surveyed in southwestern Maine in 1939 was in York County where there were 125 borers per 100 plants.

The corn borer was less abundant in 1939 than in 1938 in white potatoes grown in central Connecticut and Massachusetts. In the former State the number of borers per 100 potato plants in 1938 was 358, as compared with 145 in 1939; in the latter State, the population of the insect in each 100 plants was 280 in 1938 and 170 in 1939. The number of borers per 100 plants of potatoes in central New Jersey in 1939 averaged 17.9.

There is little doubt that the relative status of the European corn borer in 1939, as in other years, was influenced to a great extent by prevailing weather conditions during certain critical stages of the insect's development but it is difficult to give exact and satisfying reasons for the increases, decreases, or comparative stability of populations of the pest in the comparable territory surveyed in 1938 and in 1939. Dryness in the spring or summer months was probably the most adverse factor influencing survival of the corn borer in 1939, although too abundant rainfall at particular times may also have been unfavorable to the insect. Extremes in moisture conditions characterized the summer of 1939 in practically all sections of the country concerned in this report, whereas fluctuations in temperature were in general less pronounced. For instance, April was the fourth consecutive wet month in New Jersey and was also wet farther south along the Atlantic coast. The month of May was generally dry from Indiana east to the New England coast and south through New Jersey to the Eastern Shore of Virginia. In June precipitation was excessive in Ohio, Michigan, and Indiana but in the more eastern States it varied slightly above or below normal. While moisture conditions in July were about normal in Ohio, Michigan, and Indiana, the weather that month in New York State and east through most of New England and New Jersey developed into a serious drought. In New York dry weather continued into August and in Ohio the month was one of the driest Augusts on record. On the other hand August was a month of excessive rainfall in New Jersey and New England.

<sup>2/</sup>The survey of sweet corn in New York was made in cooperation with the Agricultural Experiment Station, Geneva, N. Y., and the data on infestation in this crop in Maine were kindly furnished by the State Department of Agriculture of Maine.



Table 1.--Data on abundance of European corn borer in corn, fall of 1939,  
summary by States

State	Counties	Average borers per 100 plants
	Number	Number
Connecticut-----	8	471.0
Delaware-----	3	8.9
Indiana-----	35	34.1
Maine-----	13	10.2
Maryland-----	3	5.8
Massachusetts-----	11	451.5
Michigan-----	31	148.1
New Hampshire-----	9	51.4
New Jersey-----	19	70.7
New York-----	48	61.9
Ohio-----	59	62.0
Pennsylvania-----	20	10.8
Rhode Island-----	4	664.1
Vermont-----	14	58.1
Virginia-----	2	41.4
Wisconsin-----	6	3.3
Total-----	285	--
Areal average-----	--	94.4

Table 2.--Data on abundance of European corn borer in corn, fall of 1939,  
and comparisons with data for other years.

State and county	Average borers per 100 plants		
	1932	1938	1939
	Number	Number	Number
Connecticut:			
Fairfield-----	21.1	--	321.4
Hartford-----	50.7	1,130.3	520.4
Litchfield-----	1.3	--	300.2
Middlesex-----	31.5	--	425.4
New Haven-----	2.4	842.3	503.2
New London-----	76.7	--	807.2
Tolland-----	6.7	--	366.8
Windham-----	13.0	--	523.0
Averages:			
2 counties-----	26.6	986.3	511.8
8 counties-----	25.4	--	471.0



Table 2.--Data on abundance of European corn borer in corn, fall of 1939, and comparisons with data for other years--Continued

State and county	Average borers per 100 plants		
	1936	1938	1939
	Number	Number	Number
<u>Delaware:</u>			
Kent-----	--	--	11.2
New Castle-----	--	--	4.0
Sussex-----	1.1	7.9	11.4
<u>Average:</u>			
3 counties-----	--	--	8.9
	1932	1938	1939
<u>Indiana:</u>			
Adams-----	1.4	124.7	177.0
Allen-----	7.0	105.3	147.9
Blackford-----	.1	31.7	106.4
De Kalb-----	9.8	27.7	90.3
Delaware-----	.4	12.7	16.2
Elkhart-----	.5	1.2	1.4
Fayette-----	--	5.1	3.2
Fulton-----	.2	.7	1.5
Grant-----	.1	5.1	25.4
Hamilton-----	--	1.6	4.9
Hancock-----	--	.9	3.5
Henry-----	.1	2.6	7.5
Howard-----	--	.8	15.4
Huntington-----	.7	8.7	51.0
Jay-----	.2	25.9	127.7
Kosciusko-----	.2	.9	5.3
Lagrange-----	.5	7.9	6.8
La Porte-----	--	1.1	.8
Madison-----	--	1.4	11.4
Marshall-----	.1	.2	1.1
Miami-----	0.	.8	14.3
Noble-----	1.7	21.4	38.5
Porter-----	--	.04	.04
Randolph-----	.1	8.3	38.0
Rush-----	--	1.6	7.1
St. Joseph-----	0.	.3	1.3
Shelby-----	--	.2	2.2
Starke-----	--	.3	.3
Steuben-----	2.9	34.8	44.4
Tipton-----	--	2.1	9.3
Union-----	--	4.4	5.0
Wabash-----	.5	4.0	32.4
Wayne-----	.1	4.3	3.1
Wells-----	.8	56.3	151.2
Whitley-----	1.5	18.0	41.5

Table 2. Data on abundance of European corn borer in corn, fall of 1939,  
and comparisons with data for other years.—Continued

State and county	Average borers per 100 plants		
	1932	1938	1939
	Number	Number	Number
<u>Average:</u>			
23 counties-----	1.3	21.9	49.1
35 counties-----	--	14.9	34.1
	1930	1932	1939
<u>Maine:</u>			
Androscoggin-----	--	--	0
Cumberland-----	0	--	4.6
Franklin-----	--	--	.9
Hancock-----	0	--	.2
Kennebec-----	--	--	0
Knox-----	0	--	.4
Lincoln-----	5.6	9.4	50.6
Oxford-----	--	--	1.5
Penobscot-----	--	--	.1
Sagadahoc-----	0	--	.2
Somerset-----	--	--	1.1
Waldo-----	0	--	0
York-----	.6	30.6	72.9
<u>Average:</u>			
7 counties-----	0.9	--	18.4
2 counties-----	--	20.0	61.8
13 counties-----	--	--	10.2
	1935	1938	1939
<u>Maryland:</u>			
Somerset-----	--	--	1.2
Wicomico-----	0.1	2.3	4.8
Worcester-----	18.7	15.5	11.4
<u>Average:</u>			
2 counties-----	9.4	8.9	8.1
3 counties-----	--	--	5.8
	1930	1932	1939
<u>Massachusetts:</u>			
Barnstable-----	73.7	221.4	774.8
Berkshire-----	--	--	4.8
Bristol-----	287.6	206.8	573.6
Essex-----	43.6	211.8	770.4
Franklin-----	--	9.7	104.2
Hampden-----	--	6.5	387.0
Hampshire-----	--	17.1	251.6
Middlesex-----	347.3	153.0	860.8
Norfolk-----	536.5	190.7	585.0
Plymouth-----	102.7	132.6	391.0
Worcester-----	45.4	18.8	263.4

Table 2.--Data on abundance of European corn borer in corn, fall of 1939, and comparisons with data for other years.--Continued

State and county	Average borers per 100 plants		
	1930	1932	1939
	Number	Number	Number
<u>Average:</u>			
7 counties-----	205.3	162.2	602.7
10 counties-----	--	116.8	496.2
11 counties-----	--	--	451.5
<u>Michigan:</u>	1932	1938	1939
Allegan-----	0	--	26.6
Barry-----	--	--	55.2
Berrien-----	0	--	63.0
Branch-----	0.2	--	34.0
Calhoun-----	--	--	19.4
Cass-----	0	--	6.0
Clinton-----	--	--	118.2
Eaton-----	--	--	47.0
Genesee-----	45.2	--	447.0
Gratiot-----	--	--	207.8
Hillsdale-----	2.9	--	35.6
Huron-----	22.1	--	595.0
Ingham-----	17.8	--	347.0
Ionia-----	--	--	74.8
Jackson-----	17.4	--	29.6
Kalamazoo-----	--	--	31.4
Lapeer-----	33.5	--	376.2
Lenawee-----	50.0	206.4	118.8
Livingston-----	18.0	--	7.8
Macomb-----	72.6	191.2	132.8
Monroe-----	72.7	124.8	240.0
Oakland-----	22.9	--	73.4
Saginaw-----	--	--	173.8
St. Clair-----	20.8	74.4	197.0
St. Joseph-----	.1	--	25.0
Sanilac-----	53.8	--	168.0
Shiawassee-----	--	--	242.2
Tuscola-----	50.1	--	416.4
Van Buren-----	0	--	0
Washtenaw-----	49.7	73.2	167.6
Wayne-----	59.7	65.9	116.0
<u>Average:</u>			
22 counties-----	27.7	--	164.7
6 counties-----	--	122.7	162.0
31 counties-----	--	--	148.1



Table 2.--Data on abundance of European corn borer in corn, fall of 1939,  
and comparisons with data for other years--Continued

State and county	Average borers per 100 plants		
	1932	--	1939
	Number	Number	Number
<u>New Hampshire:</u>			
Belknap-----	--	--	38.6
Carroll-----	--	--	21.6
Cheshire-----	0	--	43.4
Grafton-----	--	--	4.2
Hillsboro-----	20.4	--	103.4
Merrimack-----	--	--	36.2
Rockingham-----	24.6	--	148.8
Strafford-----	14.7	--	33.8
Sullivan-----	--	--	33.0
<u>Average:</u>			
4 counties-----	14.9	--	82.4
9 counties-----	--	--	51.4
<hr/>			
	1932	1938	1939
<u>New Jersey:</u>			
Atlantic-----	0	--	22.6
Bergen-----	--	--	292.8
Burlington-----	0	818.3	220.8
Camden-----	--	73.8	61.6
Cape May-----	--	--	1.2
Cumberland-----	--	--	14.2
Essex Union-----	--	--	147.2
Gloucester-----	--	116.7	53.0
Hunterdon-----	--	--	8.0
Mercer-----	--	639.7	22.6
Middlesex-----	--	536.1	211.0
Monmouth-----	0.9	914.9	98.6
Morris-----	--	--	57.6
Ocean-----	.2	--	23.2
Passaic-----	--	--	32.9
Salem-----	--	--	10.8
Somerset-----	--	--	40.6
Sussex-----	--	--	6.8
Warren-----	--	--	6.0
<u>Average:</u>			
4 counties-----	0.3	--	91.3
6 counties-----	--	516.6	111.3
19 counties-----	--	--	70.1

Table 2.--Data on abundance of European corn borer in corn, fall of 1939, and comparisons with data for other years--Continued

State and county	Average borers per 100 plants		
	1930	1938	1939
	Number	Number	Number
New York:			
Albany-----	1.6	--	419.4
Allegany-----	6.3	--	.8
Broome-----	--	--	2.8
Cattaraugus-----	6.7	--	13.2
Cayuga-----	7.5	--	44.0
Chautauqua-----	28.4	96.3	17.8
Chemung-----	.1	--	0
Chenango-----	--	--	27.8
Columbia-----	.9	--	139.8
Cortland-----	0	--	13.8
Delaware-----	0	--	51.6
Dutchess-----	--	--	87.8
Erie-----	22.5	72.8	34.4
Fulton-----	13.9	--	101.8
Genesee-----	23.4	--	29.2
Greene-----	1.6	--	35.8
Herkimer-----	5.0	--	41.6
Jefferson-----	47.4	252.2	51.2
Lewis-----	3.4	--	14.0
Livingston-----	18.1	--	1.2
Madison-----	1.3	--	29.8
Monroe-----	27.9	--	15.2
Montgomery-----	14.0	--	58.2
Nassau-----	0	--	251.8
Niagara-----	61.3	117.8	227.0
Oneida-----	5.4	--	53.6
Onondaga-----	4.7	--	50.6
Ontario-----	48.1	--	4.0
Orange-----	--	--	79.8
Orleans-----	94.6	--	67.8
Oswego-----	29.3	173.7	35.2
Otsego-----	.8	--	177.0
Rensselaer-----	1.9	--	160.4
Saratoga-----	8.2	--	65.4
Schenectady-----	11.1	--	50.6
Schoharie-----	4.2	--	19.8
Schuyler-----	1.8	--	.8
Seneca-----	3.8	--	1.4
Steuben-----	10.9	--	30.6
Suffolk-----	65.7	--	191.2
Sullivan-----	--	--	9.2
Tioga-----	--	--	7.0
Tompkins-----	1.6	--	12.8
Ulster-----	0	--	83.6

Table 2.--Data on abundance of European corn borer in corn, fall of 1939, and comparisons with data for other years.--Continued

State and county	Average borers per 100 plants		
	1930	1938	1939
	Number	Number	Number
<u>New York (Cont'd.):</u>			
Washington-----	9.8	--	58.0
Wayne-----	19.7	--	94.0
Wyoming-----	14.8	--	6.0
Yates-----	9.7	--	2.4
<u>Average:</u>			
42 counties-----	15.2	--	65.6
5 counties-----	--	142.6	73.1
48 counties-----	--	--	61.9
<u>Ohio:</u>			
	1932	1938	1939
Allen-----	40.6	--	154.8
Ashland-----	4.7	--	13.4
Ashtabula-----	4.8	--	35.2
Auglaize-----	20.9	--	201.4
Belmont-----	--	--	0
Carroll-----	--	--	.4
Champaign-----	8.1	--	23.6
Clark-----	1.3	--	5.8
Columbiana-----	--	--	12.0
Coshocton-----	--	--	5.2
Crawford-----	9.3	--	12.6
Cuyahoga-----	--	--	54.8
Darke-----	.3	--	23.2
Defiance-----	12.8	190.7	35.0
Delaware-----	6.0	--	29.6
Erie-----	46.1	--	22.6
Franklin-----	--	--	3.0
Fulton-----	46.2	272.3	91.8
Geauga-----	2.8	--	5.8
Guernsey-----	--	--	.4
Hancock-----	53.8	127.9	182.6
Hardin-----	37.6	--	131.6
Harrison-----	--	--	0
Henry-----	52.7	183.8	120.0
Holmes-----	--	--	.8
Huron-----	8.4	--	5.4
Jefferson-----	--	--	0
Knox-----	2.2	--	47.6
Lake-----	36.8	--	139.8
Licking-----	--	--	13.0
Logan-----	21.1	--	177.8
Lorain-----	5.6	--	31.0
Lucas-----	49.8	212.3	191.0



Table 2.--Data on abundance of European corn borer in corn, fall of 1939, and comparisons with data for other years.--Continued

State and county	Average borers per 100 plants		
	1932	1938	1939
	Number	Number	Number
<u>Ohio (Cont'd.):</u>			
Madison-----	2.5	--	23.0
Mahoning-----	--	--	8.6
Marion-----	24.8	--	278.6
Medina-----	2.6	--	4.4
Mercer-----	1.6	--	77.8
Miami-----	3.4	--	.8
Morrow-----	4.4	--	66.0
Muskingum-----	--	--	0
Ottawa-----	49.7	41.6	65.4
Paulding-----	30.5	77.1	105.4
Portage-----	.7	--	3.2
Putnam-----	48.0	40.2	211.6
Richland-----	5.5	--	30.8
Sandusky-----	66.3	104.3	80.0
Seneca-----	46.6	81.8	35.0
Shelby-----	1.9	--	56.0
Stark-----	3.7	--	4.6
Summit-----	3.2	--	3.8
Trumbull-----	--	--	2.8
Tuscarawas-----	--	--	0
Union-----	5.6	--	102.6
Van Wert-----	14.7	--	374.8
Wayne-----	3.4	--	5.2
Williams-----	27.1	136.5	35.6
Wood-----	66.5	122.3	151.2
Wyandot-----	17.2	--	160.2
<u>Average:</u>			
44 counties-----	20.5	--	80.9
12 counties-----	--	133.0	108.7
59 counties-----	--	--	62.0
<hr/>			
	1930	1935	1939
<u>Pennsylvania:</u>			
Bradford-----	0.4	--	0
Bucks-----	--	--	142.0
Carbon-----	--	--	0
Crawford-----	.5	.6	3.0
Erie-----	9.9	2.1	23.0
Lackawanna-----	--	--	0
Lawrence-----	.2	--	.4
Lehigh-----	--	--	10.4
Lycoming-----	--	--	2.0
Luzerne-----	--	--	0
Mercer-----	.5	--	4.8

Table 2.—Data on abundance of European corn borer in corn, fall of 1939,  
and comparisons with data for other years.—Continued

State and county	Average borers per 100 plants		
	1930	1935	1939
	Number	Number	Number
<u>Pennsylvania (Cont'd.):</u>			
Monroe-----	--	--	2.0
Northampton-----	--	--	18.0
Pike-----	--	--	6.0
Sullivan-----	--	--	0
Susquehanna-----	--	--	0
Tioga-----	1.8	--	0
Venango-----	.4	--	4.8
Wayne-----	--	--	0
Wyoming-----	--	--	0
<u>Average:</u>			
7 counties-----	2.0	--	5.1
2 counties-----	5.2	1.4	13.0
20 counties-----	--	--	10.8
	1930	1932	1939
<u>Rhode Island:</u>			
Bristol-Newport-----	95.1	190.0	859.6
Kent-----	61.7	110.7	572.8
Providence-----	30.7	48.1	719.4
Washington-----	21.6	24.4	504.4
<u>Average:</u>			
4 counties-----	52.3	93.3	664.1
	1932	1935	1939
<u>Vermont:</u>			
Addison-----	3.7	15.5	22.2
Bennington-----	36.9	16.9	71.4
Caledonia-----	--	--	6.8
Chittenden-----	--	31.9	117.6
Essex-----	--	--	2.8
Franklin-----	--	--	47.6
Grand Isle-----	--	146.8	106.0
Lamoille-----	--	--	40.8
Orange-----	2.4	--	51.6
Orleans-----	--	--	16.8
Rutland-----	10.7	42.4	61.0
Washington-----	--	13.9	32.4
Windham-----	4.9	--	142.8
Windsor-----	10.8	--	93.6

Table 2.--Data on abundance of European corn borer in corn, fall of 1939, and comparisons with data for other years.--Continued

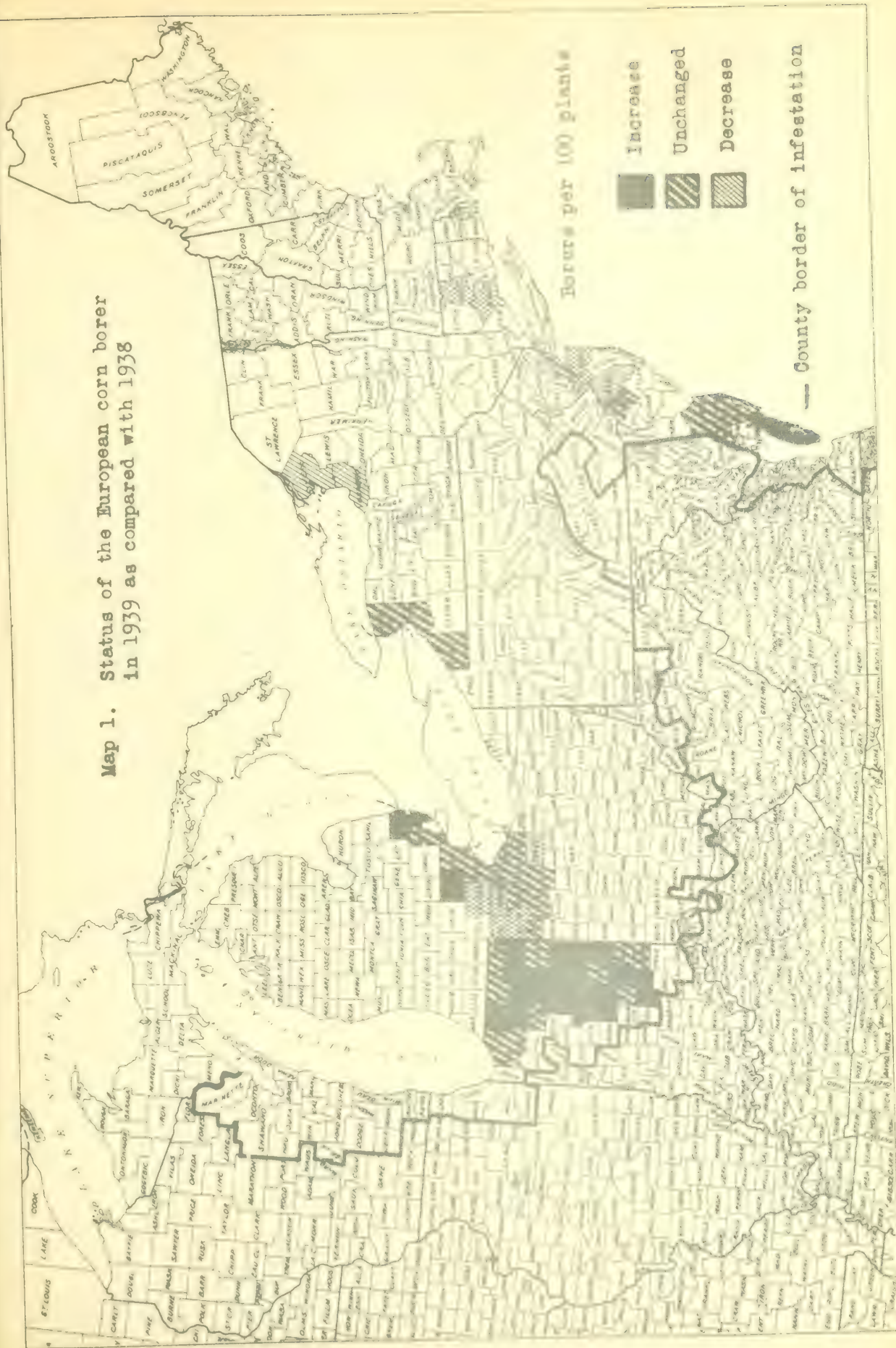
State and county	Average borers per 100 plants		
	1932	1935	1939
	Number	Number	Number
<u>Average:</u>			
6 counties-----	11.6	--	73.8
6 counties-----	--	44.6	68.4
14 counties-----	--	--	58.1
	1935	1938	1939
<u>Virginia:</u>			
Accomac-----	21.0	8.1	28.0
Northampton-----	12.9	16.4	54.8
<u>Average:</u>			
2 counties-----	17.0	12.3	41.4
<u>Wisconsin:</u>	1939	--	--
Kenosha-----	0.4	--	--
Milwaukee-----	0	--	--
Ozaukee-----	16.2	--	--
Racine-----	0	--	--
Washington-----	3.0	--	--
Waukesha-----	0	--	--
<u>Average:</u>			
6 counties-----	3.3	--	--



Table 3.--Data on abundance of European corn borer in early market sweet corn, summers of 1938 and 1939

State and county	1938		1939	
	:Average borers:		:Average borers	
	:Fields:per 100 plants:		:Fields:per 100 plants	
	:Number:	Number	:Number:	Number
<u>Connecticut:</u>	:	:	:	:
New Haven-----	25	876	25	1,980
	:	:	:	:
<u>Maine:</u>	:	:	:	:
Androscoggin-----	--	--	19	10
Cumberland-----	--	--	25	63
Lincoln-----	--	--	14	89
York-----	--	--	25	125
	:	:	:	:
<u>New Jersey:</u>	:	:	:	:
Burlington-----	21	50	29	417
	:	:	:	:
<u>New York:</u>	:	:	:	:
Albany-----	12	624	17	753
Columbia-----	8	403	17	537
Dutchess-----	--	--	3	348
Nassau-----	--	--	14	295
Rensselaer-----	--	--	5	990
Saratoga-----	--	--	7	242
Schenectady-----	7	272	5	379
Suffolk-----	--	--	11	97
Ulster-----	--	--	14	1,264
Westchester-----	--	--	1	575
	:	:	:	:
<u>Ohio:</u>	:	:	:	:
Lucas-----	25	1,751	25	817

Map 1. Status of the European corn borer in 1939 as compared with 1938



Borer per 100 plants

Increase  
Unchanged  
Decrease

— County border of infestation





**Map 2. Relative abundance of European corn borer over infested territory surveyed in 1939**

**Borers per 100 plants**

- 0-100
- 101-300
- 301-500
- 501-700
- 701-900

**County border of infestation**

**Map 2. Relative abundance of European corn borer over infested territory surveyed in 1939**

**Borers per 100 plants**

- 0-100
- 101-300
- 301-500
- 501-700
- 701-900

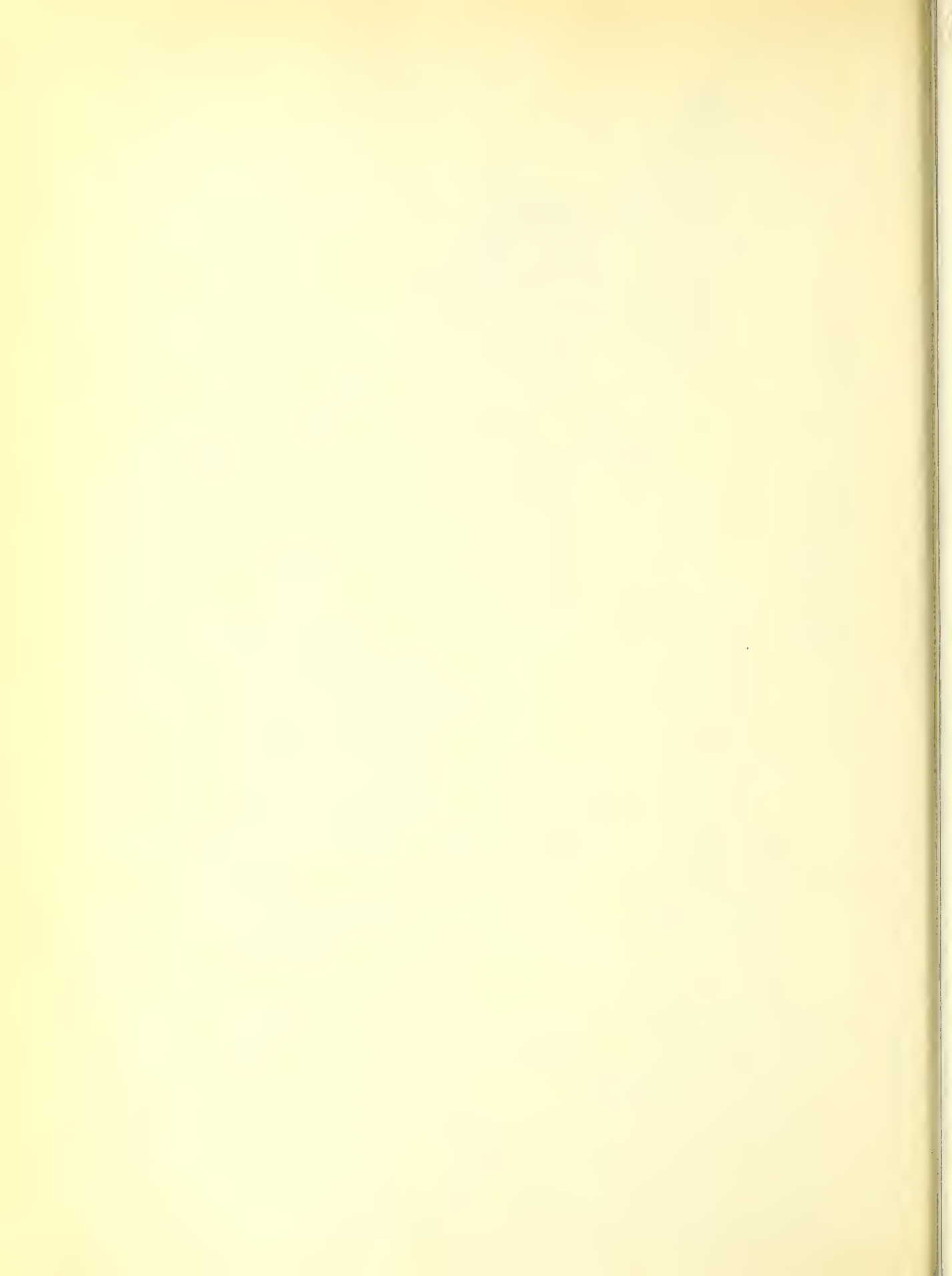
**County border of infestation**

**Map 2. Relative abundance of European corn borer over infested territory surveyed in 1939**

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- 0-100
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- 701-900

**County border of infestation**



23.10

THE INSECT PEST SURVEY  
BULLETIN

AGRICULTURAL  
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BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
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AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING





## COLONIZATION OF EUROPEAN CORN BORER PARASITES IN 1939

C. A. Clark and W. G. Bradley, Associate Entomologists  
Division of Cereal and Forage Insect Investigations  
Bureau of Entomology and Plant Quarantine  
United States Department of Agriculture

During the 1939 season a total of 81,452 adult parasites, including Chelonus annulipes Wesm., Macrocentrus gifuensis Ashm., Inareolata punctoria Roman, Lydella grisescens R.D., and Phaeogenes nigridens Wesm., were shipped for release against the European corn borer (Pyrausta nubilalis Hbn.) in the United States. The total number actually released was 80,694, of which 75,026 were the egg-larval parasite C. annulipes.

The mortality in all shipments was 758 adults, or 0.9 percent of the 81,452 handled. The highest average mortality for any species (5.3 percent) occurred, as previously, with the delicate braconid M. gifuensis. The mortality in the large shipments of C. annulipes was 0.6 percent. There was no mortality in the transfer of I. punctoria, L. grisescens, or P. nigridens, but these parasites were taken only a short distance by car from the Moorestown, N. J., laboratory.

All shipments were made in screen-sided metal cans wrapped in wet cloth, with 250 adult parasites per can. Consignments of Chelonus annulipes to the eastern or multiple-generation area were sent in iced shipping containers by railway express from the Toledo, Ohio, corn-borer laboratory. Shipping containers utilized are described in Bureau of Entomology and Plant Quarantine ET Circular 77. Shipments other than those of C. annulipes to the eastern area were made in iced containers transported by automobile.

In previous years the cloth-wrapped cans had been placed in individual corrugated cardboard cartons. In 1939 this carton was dispensed with for all shipments of C. annulipes from Toledo, thus reducing weight and space requirements. That no harmful effect resulted from the omission of the corrugated cartons is evidenced by the low mortality sustained by this species.

Table 1 lists the parasite shipments made in 1939 and gives the mortality for each shipment.

Table 1.--Shipments of corn-borer parasites for release during 1939

Species	Parasites shipped	Date of shipment	Destination	Mortality
	Number			Percent
<u>P. nigridens</u> ---	33	April 27	Burlington, N. J.	0
<u>L. griseus</u> ---	60	June 16	do	0
Do-----	60	21	do	0
<u>C. annulipes</u> ---	9,000	9	Springfield, Mass.	0.7
Do-----	12,000	13	do	.7
Do-----	13,000	16	do	.4
Do-----	14,000	19	do	.6
Do-----	8,000	21	North Philadelphia, Pa.	.5
Do-----	15,000	26	do	.9
Do-----	4,500	29	Indiana	.5
<u>M. gifuensis</u> ---	1,190	July 1	Atlantic, N. J.	3.9
Do-----	883	6	do	1.8
Do-----	225	14	do	<sup>1/2</sup> 25.8
Do-----	625	Aug. 16	Burlington, N. J.	0
Do-----	2,065	23	Kingston, N. Y.	7.9
Do-----	385	29	Burlington, N. J.	0
<u>I. punctoria</u> ---	176	5	do	0
Do-----	153	8	do	0
Do-----	97	16	do	0
Total-----	81,452	--	--	--
Average mortality:	--	--	--	0.9

<sup>1/</sup> Mostly old parasites accumulated at laboratory.

The major emphasis in the corn borer parasite colonization program for 1939 was placed on an attempt to establish the egg-larval parasite Chelonus annulipes Wesm. in two districts where the corn borer has been particularly abundant and has caused considerable damage. These were the Connecticut and the Quinnipiac River Valleys in Connecticut<sup>1/</sup> and the Hudson River Valley, south of Albany in New York State.

A colonization program was devised, involving releases of this parasite at 4- and 5-mile intervals throughout the districts chosen. This method of colonization, a departure from the single-colony type usually employed for releases of corn borer parasites, was selected after consideration of the habits and reaction of the parasite, both in Europe and the United States. In northern Italy, the region from which C. annulipes was imported, its distribution is extremely uneven. It is abundant in certain localities and absent in others a short distance away. In the vicinity of Taunton, Mass., the area of continuous parasitization has increased in size and within this restricted area parasitization by C. annulipes compares favorably with that produced by other parasites of the corn borer. However

<sup>1/</sup>Geologically the old Connecticut River Valley, extending from the Massachusetts State line to Hartford, Conn., thence southwest to Long Island Sound. The Connecticut River now flows from south of Hartford in a general southeastward direction to the sound.



at the actual points of release, which are within 10 miles of the center of the area in which the parasite is now well established, no parasites have been recovered.

These observations indicate that Chelonus annulipes can exist only in more or less restricted ecological areas and that the success of colonization attempts depended to a large extent on whether or not the release was made near the more favorable part of one of these areas. As the factors which limit this parasite to specific areas were not readily determinable, and in order to establish the practical utility of close colonization as a measure conducive to more rapid build-up of parasite populations than that obtained by dispersion from widely separated release points, the colonies in the 1939 release areas were so closely spaced that there would be a high probability of locating 1 or more colonies near the center of favorable ecological islands, should any be present in the region. During the season 48 releases, totaling 47,724 parasites, were made in Connecticut and 23 releases, totaling 22,826 adults, were made in the Hudson River Valley, N. Y.

In order to test the effects of climatic changes experienced during recent years and the influences that might result from the prevalence of a two-generation strain of the borer in the Lake States, 4 colonies totaling 4,476 adults of C. annulipes, were released in northeastern Indiana.

Field examinations made at the time of the releases of C. annulipes in the lower Hudson River Valley showed that, although host eggs were still present in small numbers in the fields, the releases here were later than optimum for good synchronization. This probably was also true for the releases of this species in Indiana, where information received from State officials indicated that the peak of host oviposition occurred about June 26, although the parasites were not released in this district until June 29. All other releases appear to have been very well synchronized with the presence of the borer in a favorable stage for attack. The synchronization of the large releases of C. annulipes in Connecticut with the presence of corn borer eggs was particularly satisfactory, host eggs being present in unusually large numbers. All adults of Chelonus annulipes released consisted of individuals bred on Ephestia kuehniella Zell. at the Toledo, Ohio, corn borer laboratory. The original breeding stock of the parasite was obtained from corn borer larvae collected at the point where this parasite is now well established in southeastern Massachusetts.

The polyembryonic parasite Macrocentrus gifuensis Ashm., which attacks your corn borer larvae, is well established in a locality in eastern Massachusetts and it was desired to extend the distribution of this species, although no large-scale program was attempted. Colonies of 1,902 and 2,177 adults were released at Kingston, Ulster County, N. Y., and in Atlantic Township, Monmouth County, N. J. Smaller releases were made in Burlington Township, Burlington County, N. J., where this parasite had been released previously. The adults of M. gifuensis released during the first half of July were reared from borers collected in Massachusetts in the spring of 1939 to supply this parasite. The parasite releases made in August against the second generation of the borer were made possible by parasites obtained incident to parasite-field-status studies at Taunton, Mass., on the first generation of the borer.

Releases of small numbers of the ichneumonid Inareolata punctoria Roman, the tachinid Lydella grisescens R. D., and the pupal parasite Phaeogenes nigridens Wesm. were also made at the Burlington, N. J., parasite-release site.

The releases of adults of Chelonus annulipes by States, counties, and towns are listed in table 2. Similar data relative to all other parasites released in 1939 are presented in table 3.

Table 2.---Liberations of Chelonus annulipes Wesm. in the United States in 1939<sup>1/</sup> by States

State and county	Township	Date of release	Parasites released	State and county	Township	Date of release	Parasites released
			Number				Number
Connecticut:				New York:			
	Fairfield	June 10	996	Albany	Coeymans	June 22	999
				Columbia	Germanatown	28	994
	Hartford	20	994		Greenport	22	997
					Kinderhook	22	988
					Kinderhook	23	994
					Livingston	28	989
					Stockport	22	996
				Dutchess	Clinton	28	993
					Hyde Park	28	990
					Poughkeepsie	28	983
					Red Hook	28	1,965
					Rhinebeck	28	987
				Greene	Athens	22	990
					Catskill	27	991
					Coxsackie	22	998
					New Baltimore	22	997
				Ulster	Esopus	27	2,995
					Kingston	27	995
					Saugerties	27	1,985
				Total		--	22,826
				Indiana:			
				Adams	Union	June 29	1,246
				Allen	Jackson	29	1,238
				DeKalb	Butler	29	995
				Noble	Washington	29	997
				Total		--	4,476
				Grand total:			
				all States:		--	75,026
Tolland							
Total			47,724				

<sup>1/</sup> For previous releases of European corn borer parasites in the United States see The Insect Pest Survey Bulletin, Vol. 18, Supplement to No. 9, 1938.



Table 3.--Liberations of European corn borer parasites other than *Chelonus annulipes* in the United States in 1939, by States

State and county	Township	Date of release	Parasite species released			
			<i>Macrocentrus flavensis</i>	<i>Inareolata punctoria</i>	<i>Lydella grisescens</i>	<i>Phaenogenes nigridentis</i>
New Jersey:			Number	Number	Number	Number
Burlington	Burlington	April 27	--	--	--	33
	do	June 16	--	--	60	--
	do	21	--	--	60	--
	do	August 5	--	176	--	--
	do	8	--	153	--	--
	do	16	625	97	--	--
	do	29	385	--	--	--
Monmouth	Atlantic	July 1	1,143	--	--	--
	do	6	867	--	--	--
	do	14	167	--	--	--
Total	--	--	3,187	426	120	33
New York:						
Ulster	Kingston	August 23	1,902	--	--	--
Grand total, all States	--	--	5,089	426	120	33

**THE INSECT PEST SURVEY  
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Summary for 1939

Number 10

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**BUREAU OF  
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AND  
THE STATE ENTOMOLOGICAL  
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## INTRODUCTION

The weather of 1939 followed the general trend of abnormal warmth for the last several years. The winter of 1938-39 was unusually warm over the entire country, very dry in the fall, but there was abundant rainfall during the winter so that spring started with plenty of soil moisture.

The spring months were warm and dry except in the northeastern quarter of the United States, where unusually cool, wet weather prevailed.

In June and July the temperature generally was near normal. Rainfall was varied, being abundant in Ohio Valley and the Southern Atlantic States. Much of the West, the Plains States, and the Northeastern States were deficient in rainfall.

August was very hot over the entire country and very dry, except on the west coast and in the Southeastern States.

September also brought abnormally high temperatures and widespread deficiencies in precipitation. A severe and widespread drought developed throughout the Great Plains and the central valley. The abnormally warm dry weather continued into October, rain being scanty except in the northeastern part of the country.

The weather was favorable for grasshoppers, as it was rather warm and dry at the time of hatching. It also facilitated development of the young hoppers, and allowed rapid movement into cultivated crops.

The spring was cool and wet in much of the chinch bug belt, proving unfavorable to the development of the insect. On the other hand the warm, dry weather in the fall favored development of the insect, allowing more nymphs to mature and, consequently, a heavy population went into hibernation.

The warm dry fall had an indirect effect on theessian fly, the wheat sown prior to fly-free dates being slow in germinating because of the lack of soil moisture.

## GRASSHOPPERS

Severe infestations occurred in all states west of the Mississippi River, especially in the northern Great Plains States. At the time when grasshopper eggs were hatching, these insects were favored by the warm, dry weather which prevailed over most of infested area. In the South hatching started the latter half of April and continued without interruption so that by the end of May Melanoplus mexicanus Sauss. and M. bivittatus Say were entirely through hatching except in isolated districts. M. differentialis was later in developing. By

this time the range grasshopper (Disosteira longipennis Thos.) in northeastern New Mexico, southeastern Colorado, western Kansas, and the Panhandles of Oklahoma and Texas had completed a 100-percent hatch, except in the higher altitudes. The young hoppers developed rapidly and, in spite of control operations, moved into cultivated crops.

Prolonged cold rainy weather in late May and early June in the Northern Great Plains delayed growth of the nymphs, interfered with control operations and considerably reduced infestations in the eastern part of the infested area. Adults were maturing generally by the last of June. Small local flights occurred in Nebraska and Kansas. More extensive flights occurred in eastern Montana, where all green vegetation was devoured. About 25,000,000 acres was baited, and although the average percentage of damage to crops was small, crops in some fields were completely destroyed. D. longipennis was so successfully controlled, that it is believed that with 1 more year of intensive baiting the outbreak will be practically eliminated. The egg survey carried on in the fall showed a marked decrease in the extent and severity of the infestations. A map based on the survey is appended.

#### CHINCH BUG

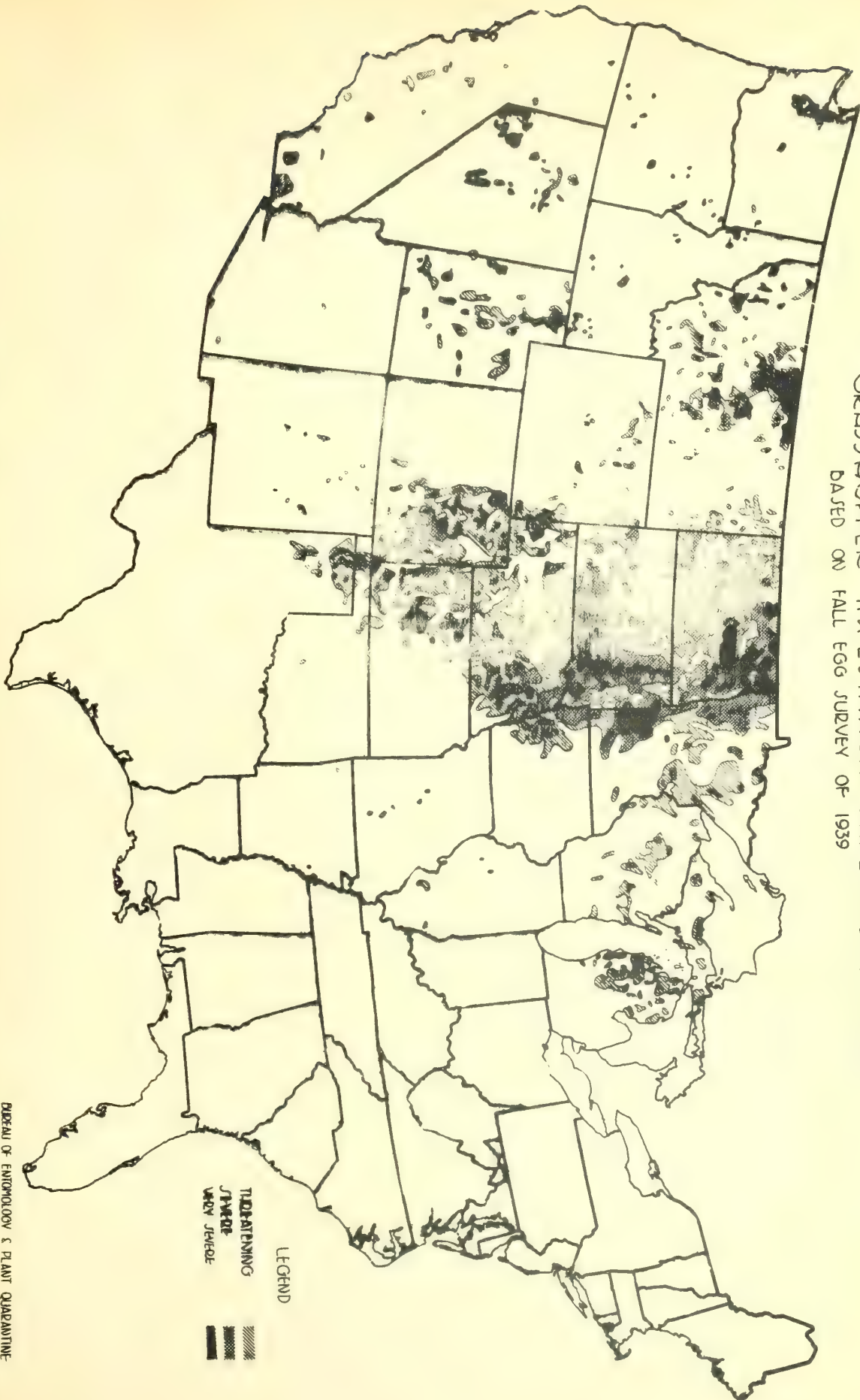
The seasonal development of the chinch bug during 1939 largely duplicated that of 1938. The threat of rather general moderate-to-severe infestations from central Ohio across Indiana, Illinois, southern Iowa, most of Missouri to southeastern Nebraska, eastern Kansas, and eastern Oklahoma was mostly removed by the cold wet spring, which delayed flight from hibernation quarters to the small grains and later destroyed most of the nymphs of the spring brood. As a result, damage was restricted to comparatively few scattered localities throughout the area. Some local damage was also reported from Michigan, Wisconsin, South Carolina, and Texas. However, as a result of drought over the area late in the summer and fall, the second-brood nymphs (and third-brood nymphs as reported from Oklahoma and Kansas) had unusually favorable conditions for completion of their development and subsequent flight of adults to winter hibernation quarters. Early returns from a survey covering the chinch bug area, which is not yet completed, and information from various State entomologists, indicate sufficiently heavy concentrations of bugs present in winter hibernation from north-central Ohio across north-central Indiana and Illinois, central and southern Iowa, most of Missouri, to southeastern Nebraska, eastern Kansas, and Oklahoma, to produce widespread moderate-to-severe infestations next spring and early summer, provided weather conditions are favorable to the bugs. Illinois reports the largest numbers of bugs in winter quarters in some localities since the fall of 1933. (P. Luginbill and C. Benton, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### MORMON CRICKET

The first hatch of the Mormon cricket was reported on March 10 in Oregon and on March 14 in Nevada. After these dates hatching was reported as continuous and even, over the entire infested area until the last of April, when most of the eggs had hatched. Severe infestations developed in most of the infested area; however, material damage to cultivated crops was prevented by intensive control operations. Mormon crickets caused unusual defoliation of young ponderosa pines near the lower edge of pine growth on the Whitman National Forest. In addition to stripping the foliage from up to 10 or 12 feet high, the migrating



# GRASSHOPPER INFESTATION EXPECTED IN 1940 BASED ON FALL EGG SURVEY OF 1939



## LEGEND

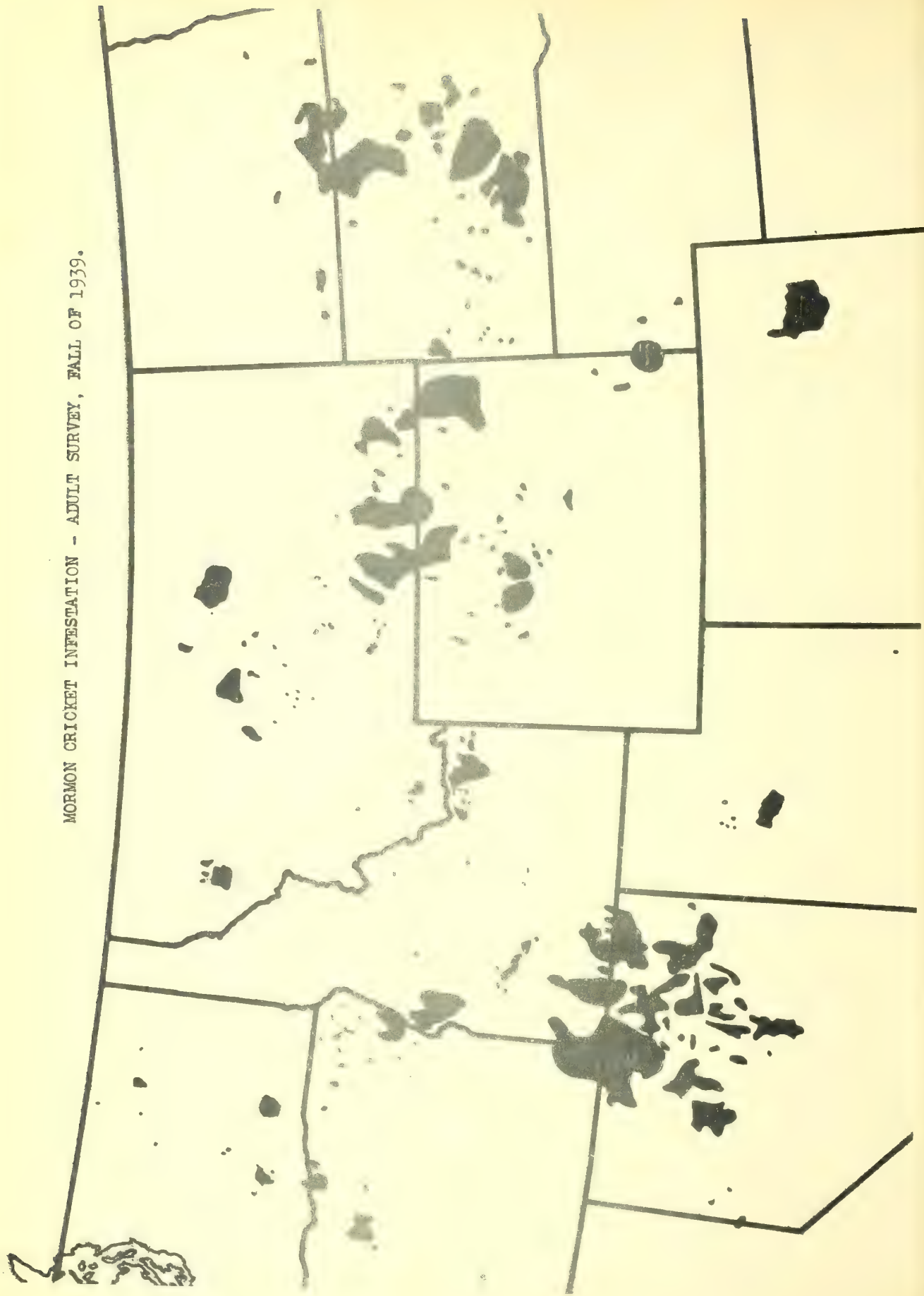
THREATENING  
SEVERE  
VERY SEVERE







MORMON CRICKET INFESTATION - ADULT SURVEY, FALL OF 1939.





crickets also ate many of the pine leaders. A map based on the adult survey, showing the areas likely to be infested in 1940, is appended. This is less than half the territory heavily infested last year.

#### HESSIAN FLY

At harvest time the surveys of wheat stubble, made by the Bureau of Entomology and Plant Quarantine field stations and cooperating State agencies, indicated that hessian fly infestations were low in wheatfields throughout Maryland, Delaware, Virginia, north-central North Carolina, Tennessee, southern Illinois, and central and western Kansas. Infestations ranged from low to moderate in eastern and south-central Pennsylvania, Kentucky, southern Indiana, southern Michigan, Missouri, Iowa, eastern Kansas, and southeastern Nebraska. There were menacing populations of flies in local fields in most of the States or districts. From moderate to heavy infestations of the hessian fly were recorded in north-central and western Pennsylvania, north-central Ohio, the northern two-thirds of Indiana, and central Illinois, and in these areas the fly was most menacing. Conditions were favorable for the hessian fly and for growths of volunteer wheat during the early part of the summer but most unfavorable during the fall period. Owing to the drought during September and October, most wheat was not planted until the suggested safe-seeding dates and as for the few early seedings very little came up in advance of the regular seeding. There was some late emergence of the fly in October but oviposition was low and larval establishment generally low or lacking. Occasional light infestations were found in regular fall wheat seedings in Indiana, Illinois, Maryland, Pennsylvania, Kansas, and Missouri, with possibilities of minor infestations in local fields, but with little likelihood of severe or general injury to the 1940 crop in any part of the Wheat Belt. (W. B. Cartwright, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### ALFALFA WEEVIL

The following summary of alfalfa weevil conditions during 1939 is based on reports from State and county officials, supplemented by limited observations of the alfalfa weevil laboratory staff. Data assembled by W. E. Shull indicate that in Idaho severe weevil damage was general in the upper Snake River Valley and was spotted in south-central counties and in the western counties of Canyon and Owyhee. Severe damage was general in Douglas County and was spotted in Churchill, Lyon, Washoe, and Elko Counties, Nev., according to George G. Schweis. W. W. Owens reports that weevil damage was fairly common in Utah, being most severe in Sanpete and Sevier Counties and in the seed areas of Millard and Uintah Counties. In California this season weevil abundance reached a general level from three to four times as great as during any previous season but, notwithstanding this fact, damage was negligible. In western Colorado economic damage was confined to a few fields, weevil injury being considerably less than in 1937 and 1938, according to J. H. Newton. There was no damage to the first crop in the Rogue River Valley of Oregon, and in Nebraska, except for a single field in the western part of Scotts Bluff County, no noticeable damage occurred. C. L. Corkins reports alfalfa weevil damage in 1939 as the most severe ever experienced in Wyoming, particularly in Fremont and Uintah Counties. In other sections of the weevil territory damage was slight, negligible, or unreported. The season's scouting by Federal and State officials, already reported in the Insect Pest Survey Bulletin, resulted in original discovery of the alfalfa weevil in Crock County, Wyo., Larimer County, Colo., and Morrill and Sheridan Counties, Nebr., and confirmed discovery of the weevil in Big Horn County, Mont., during 1938. (J. C. Hanlin, Bureau of Entomology and

Plant Quarantine, U. S. D. A.)

## VETCH BRUCHID

In North Carolina the eggs of the vetch bruchid began to appear a week later than was the case in 1938. The first eggs were observed on May 11 and larvae did not emerge until about May 20. This was due, it is believed, to the unseasonably low temperatures prevailing during April. In May the known distribution of the vetch bruchid in the Eastern States was extended in North Carolina into Beaufort, Pender, and Wilson Counties and in South Carolina into Abbeville, Anderson, Chester, Greenwood, Laurens, and Union Counties.

Six shipments of the parasites Tetrastichus sp. and Triaspis thoracicus Curt. were released at Salisbury and Statesville, N. C. In August operations were begun at Carlisle, Pa., in an attempt to breed the hymenopterous egg parasite Triaspis thoracicus in numbers from a stock of 3,000 adults supplied by the Division of Foreign Parasite Introduction, using Acanthoscelides obtectus Say as the host. By the end of September some 26,500 eggs of the latter insect had been exposed to parasitization.

The discovery of the vetch bruchid in August 1938 in the Willamette Valley, Oreg., occurred at too late a period in the seasonal development of the insect to permit a thorough survey for the purpose of delimiting the area of infestation. Such a survey was therefore conducted in 1939 in southern Washington and northern Oregon by the Bureau, assisted by the experiment stations of both States. The following counties were found infested in Oregon: Clackamas, Deschutes, Hood River, Marion, Wasco, Washington, and Yamhill; in Washington: Clark, Cowlitz, Klickitat, and Skamania. The areas exhibiting greatest abundance of the bruchid were Hood River County, Oreg., and Klickitat County, Wash., where volunteer hairy vetch was growing abundantly in the orchard districts. West of the Cascade Mountains, in proximity to extensive seed-growing areas, B. brachialis was found in numbers in eastern Clark County, Wash., and in Multnomah, Clackamas, and Washington Counties, Oreg. The infestation in the seed-growing sections of western Oregon is still slight and the evidence seems to indicate that infestation in the Pacific Northwest originated in the Cascade orchard district near Hood River, Oreg., and White Salmon, Wash. Although this is not a seed-raising section, vetch was extensively used here as a cover crop some years ago, and probably European seed carrying the bruchid was introduced at that time. The insect thus may have reached the vetch seed-growing areas west of the Cascades by natural spread, and it is now distributed thinly over an area of approximately 3,000 square miles in that region. The first adults were observed this year in western Clackamas County on April 17. Mating was in progress near Corvallis, Oreg., on May 19 and eggs were being deposited on May 28. First-instar larvae were observed on June 16.

The first indication yet obtained regarding the possible place of hibernation of this species was when members of the Bureau staff at Forest Grove, Oreg., found adults at Wilsonville, Oreg., on October 13, 1939, hidden under lichens and mosses on the trunk and main limbs of an oak tree standing on the edge of a heavily infested field. Examination of similar locations in the Southeastern States had failed to show the presence of hibernating beetles. (W. R. Walton, Bureau of Entomology and Plant Quarantine, U. S. D. A.)



## JAPANESE BEETLE

The 1938-39 brood of the Japanese beetle (Popillia japonica Newm.) was characterized by a consistent retarded development in each of the stages. Following an unusually late development of larvae in the fall of 1938, a higher-than-normal percentage of larvae entered hibernation as second instars. A somewhat wet, cool spring appears to have further retarded development so that general emergence of beetles in 1939 was from 10 days to 2 weeks later than normal.

At the close of the 1939 beetle season the area of general distribution was estimated to occupy approximately 16,300 square miles, an increase of 1,183 square miles over that of the previous year. This area was distributed among the various States as follows: Connecticut, 286 square miles; New York 1,141; New Jersey, 7,250; Pennsylvania, 5,013; Maryland, 1,546; and Delaware, 1,064. The following points roughly define the limits of the area of general distribution: Lincoln and Edwardsville, Del; Church Hill, Elkridge, Ellicott City, Lutherville, and Norrisville, Md.; Brogueville, West York, New Kingstown, New Buffalo, Hershey, Hamburg, Nazareth, and Stroudsburg, Pa.; Andover and Pompton Lakes, N. J.; Suffern and West Point, N. Y.; and Danbury and Stratford, Conn.

The regional concentration of beetles varied markedly throughout the area of general distribution, as indicated in the accompanying map. As has been the case for the last several years, the infestation was most severe in northern Delaware, northeastern Maryland, and extreme southeastern Pennsylvania. Within this area the infestation, generally speaking, was of about the same severity as that observed in 1938, with heavy foliage injury advancing from 1 to 5 miles beyond points observed the preceding year. Throughout the remainder of the area of general distribution the infestation was somewhat spotty, as compared with 1938, in many areas appearing to be heavier than in 1938, while in others it was lighter. On Staten Island and in most of the New York metropolitan area the infestation was not as heavy as the previous year, while north of the city and throughout Connecticut there appeared to be a decided increase. For the first time in several years an increase was observed in the oldest infested area in the vicinity of Moorestown, N. J.

A survey of a number of secondary centers of dispersal situated on the Eastern Shore of Maryland and Virginia revealed that a considerable amount of dispersal had taken place. The largest area generally infested involved approximately 415 square miles in Somerset and Worcester Counties, Md., and Accomac County, Va.

In New England there was in 1939 a general increase in beetle abundance at practically all of the known colony sites, the increase being especially noticeable throughout the southern half of that area. General population increase and local dispersion appears to have occurred at such large centers as metropolitan Boston, Mass., Providence, R. I., and New Haven and Bridgeport, Conn. The natural dispersion of the insect in southwestern Connecticut is gradually meeting and fusing with localized colonies in suburban areas along Long Island Sound. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Trapping activities outside of the main Japanese beetle infested area disclosed a very moderate spread of infestation during the last year. The 1939



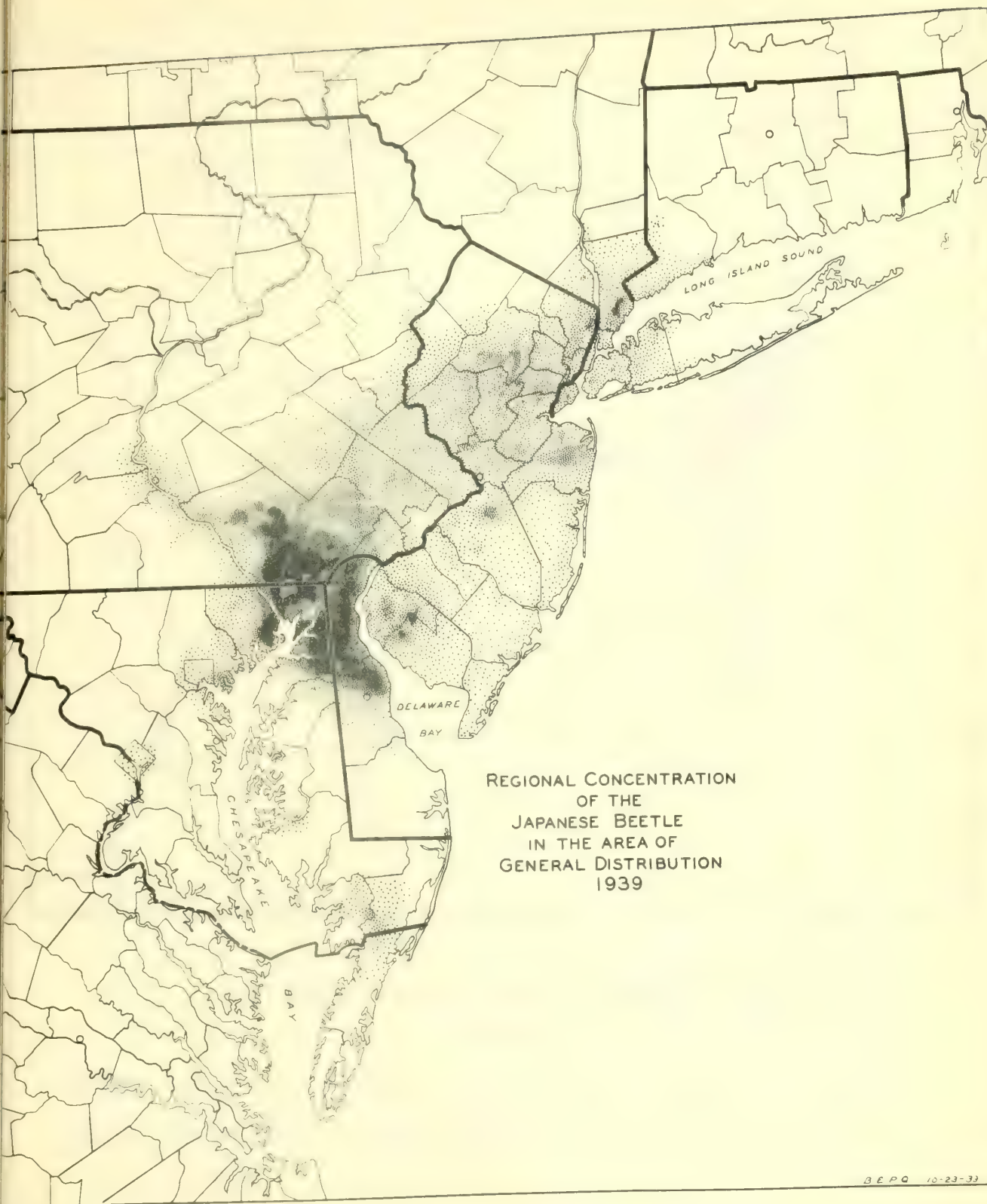
trapping program started on April 18 in the Southern States and extended to September 7 in some of the northern cities in which beetles had been caught during the season. A total of 79,537 traps were distributed by the Bureau in 491 cities and towns located in 37 States. With the exception of Arkansas, Montana, Oklahoma, and South Dakota, some degree of trapping was undertaken in all States outside of the main infested territory. The major portion of the trapping was concentrated in States already partially infested or contiguous to the main infested zone, and in cities in which isolated infestations had been found. This centered most of the trapping in New York, North Carolina, South Carolina, Ohio, Pennsylvania, Virginia, and West Virginia, and in Atlanta, Ga., Chicago, Ill., Indianapolis, Ind., Louisville, Ky., Detroit, Mich., and St. Louis, Mo. Trapping in States west of the Mississippi River was limited to the operation of traps by the network of Bureau field stations scattered throughout the Midwestern and Western States. Results during 1939 paralleled those of 1938 in that few first-record infestations were found and most of these consisted of a few beetles each. Of the 35 localities in which beetles were trapped for the first time, 30 contained infestations of an incipient nature. Only 5 were large enough to warrant quarantine or control measures. There were 67 carry-over infestations in nonregulated territory, 32 of which were still of a minor nature. Twenty-four residual infestations were of some magnitude. Most of these were adequately treated with lead arsenate. There remained at the end of the year 11 localities in Ohio, Pennsylvania, and North Carolina that were subject to quarantine. Reports from Maryland officials in charge of the cooperative campaign for Japanese beetle retardation in that State show that approximately 100,000 traps were set throughout the State during the summer of 1939 and that these traps caught over 104 tons of beetles. This is a tremendous increase over the 42.3 tons trapped in 1938. In addition to the trapping, this retardation program involved spraying, dusting, soil treatments, biological control, and adjustment of agricultural practices. (William Middleton, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### FRUIT APHIDS

Early in season aphid eggs were reported in abundance from the northeastern one-fourth of the country. Warm weather caused hatching to start earlier than usual, and outbreaks in most of the fruit-growing districts appeared imminent. Cool weather late in April and May retarded development of the aphids, and parasites were probably active. The combination of environmental factors tended to keep the insects in check and the impending outbreaks failed to materialize. The apple grain aphid and the green aphid caused some injury in scattered localities. The most injurious species, the rosy aphid, caused considerable injury in western New York, around Staunton, Va., and in southwestern Indiana. The species also became abundant late in the season in Georgia, where it caused some injury.

#### CODLING MOTH

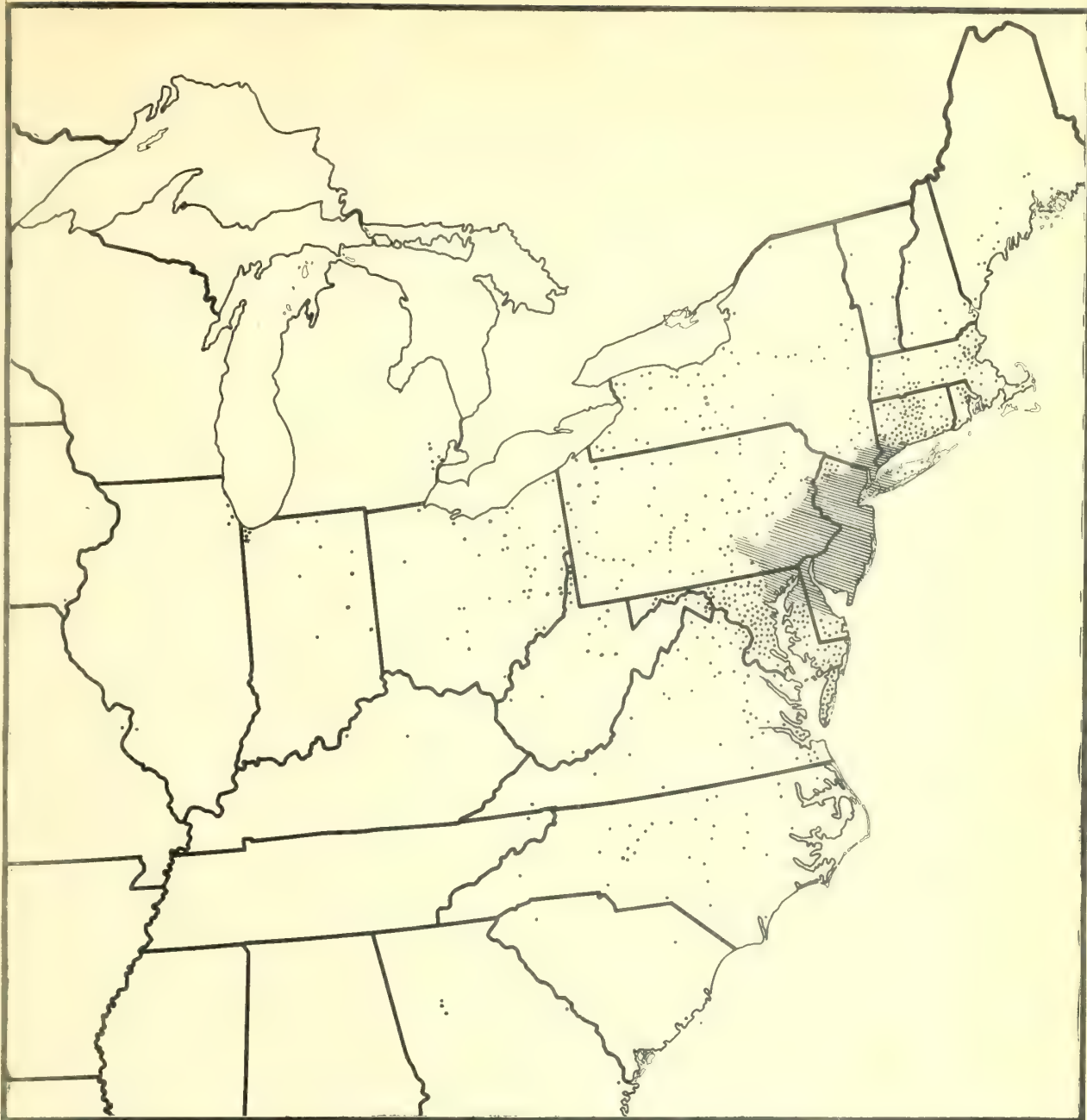
This pest entered the season in many localities with a moderate carry-over and, although the crop was heavy, control was largely successful early in the season. Warm, dry weather late in the season rendered control more difficult and permitted development of a large population over wide areas. First emergence was noted in Alabama on April 4, in northern Georgia and at Yakima, Wash., late in April; in southern Indiana, western Kentucky, and the valley of Virginia early in May; in the Hudson Valley late in May. First-brood adults were noted late in



REGIONAL CONCENTRATION  
OF THE  
JAPANESE BEETLE  
IN THE AREA OF  
GENERAL DISTRIBUTION  
1939







## DISTRIBUTION OF THE JAPANESE BEETLE 1939

-  AREA CONTINUOUSLY INFESTED BY NATURAL SPREAD.
-  LOCALIZED COLONIES OR POINTS OF MINOR OCCURRENCE.

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June in Virginia and the middle of July in the Hudson Valley. Second-brood larvae were active in July in the Middle States, and third-brood activity persisted into early fall. Missouri and Illinois reported first brood well "bunched," increasing facility of early control. The species was noted as quite active and numerous, especially late in the season, in Delaware, Indiana, Kansas, Missouri, New Jersey, Oregon, Utah, Virginia, and Washington. It was below normal in Wisconsin and Minnesota and about average in Massachusetts. In New York the situation varied locally. Damage to cherries was reported from Utah. Arkansas reported small numbers following a small crop in 1938. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### ORIENTAL FRUIT MOTH

The oriental fruit moth in general seemed to be present in only normal numbers or less, in the Middle Atlantic, North Atlantic, and Middle Western States. It appeared to be somewhat above normal in the Southeastern States, although a late start in the spring was observed in some cases. It was noted as about normal or a little below normal in Massachusetts, Connecticut, and New York. Little injury was reported from Delaware. From southwestern Virginia to southern New Jersey 14 localities were sampled, infestation of ripe peaches (Elberta and similar varieties) ranging from 1 to 35 percent. Oriental fruit moth caused considerable injury in South Carolina, Tennessee, Georgia, Alabama, and Mississippi, and its work was observed in northern Florida. It was observed in Indiana and noted as injuring apple. It was not especially noted in Illinois and Michigan, and was recorded as scarcer than last year in Kentucky. It was widely reported but not very injurious in Missouri. Injury was quite noticeable in Ohio. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### EASTERN TENT CATERPILLAR

In 1939 this species was not often reported as especially abundant. In general, fewer reports were made than in 1938, and more decreases than increases were reported. Abundance was only local in character where it occurred. The species, however, was widely observed from Mississippi and Florida to Wisconsin and Maine. Hatching was reported early in March in Mississippi, later in March in North Carolina, early in April in Delaware, in April in New Jersey and Pennsylvania, late in April in New York, and early in May in Vermont and Maine. Larval activity was noticeable late in March in northern Florida, early in April in Alabama and Mississippi, in April in Virginia and the Carolinas, in May in New Jersey, New York, Pennsylvania, and Wisconsin, late in May in Michigan, and early in June in Maine. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### PEAR PSYLLA

This species attracted considerable attention in 1939 because of its unexpected appearance in the Pacific Northwest. Elsewhere it did not receive much notice. It was observed in New York, where adults became active late in March, eggs were present late in April and numerous early in May, and hatching began the middle of May. It gave only local trouble and control was reported as not difficult. It was also observed in Lebanon County, Pa. In Washington it was first observed in the Spokane Valley late in July. Numbers were considerable and in some cases injury was done. In August it was found that the infestation extended a few miles across the Idaho State line. The infested area is a few miles



across, contains several thousand pear trees, and is separated from commercial pear-growing areas by a considerable distance. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### COMSTOCK'S MEALYBUG

Comstock's mealybug on apple is receiving considerable attention in Virginia where it causes a black sooty mold to grow on the fruit. This condition became evident in 1934 and since that time the insect has spread and the fungus is causing serious injury. In 1939 it was very injurious. Since the insect was first identified by H. Morrison as appearing in the United States in Indiana and Maryland in 1916, it has spread to include Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Virginia, West Virginia, South Carolina, Florida, Ohio, Michigan, Iowa, Mississippi, Louisiana, and California. We have questionable records from North Dakota and Washington. It was reported for the first time in 1938 in Ohio and Michigan, and both States reported infestations again in 1939. The infestation on apple in Virginia in 1939 was the most general that has been observed. There are three general areas of infestation, the Crozet area, the Roanoke area, and the Winchester area.

#### BEEF LEAFHOPPER

Above-normal fall temperatures in 1937, together with sufficient precipitation, permitted a good germination of downy choss. Excessive precipitation in March 1938 permitted a much more dense and widespread germination, resulting in excellent stands of this nonhost in certain Russian-thistle areas. Dense stands of downy choss intermixed with Russian-thistle, the most favorable summer host, reduces the suitability of such areas for reproduction of large numbers of leafhoppers. These summer host-plant conditions and a small spring generation of leafhoppers were important factors in the production of a low fall population. September surveys of Russian-thistle areas in southern Idaho in 1938 showed the lowest beef leafhopper population recorded in the last 5 years, although fall weather conditions before the first killing frost, which occurred throughout southern Idaho on October 18, were favorable for the complete development of a late-summer or fall generation of the leafhopper. Late-fall and winter host plants, such as green tansymustard, flixweed, and peppergrass, germinated freely as a result of the precipitation during October and early in November; consequently, the comparatively small number of leafhoppers produced during the summer on Russian-thistle found suitable fall and winter host plants and entered the winter under favorable conditions. The winter was mild and dry and, in general, was favorable for survival.

Early spring surveys in the desert breeding areas showed the lowest population of overwintered leafhoppers since 1936. Poor survival of green tansymustard resulted in a very sparse growth of this important spring breeding host plant in most sections. The spring generation of beef leafhoppers in southern Idaho was very small, owing to the low population of overwintered leafhoppers and a scarcity of favorable host plants on which to reproduce. The initial movement of the spring generation into the cultivated area occurred on May 17 and the peak was reached on June 14. The number of leafhoppers in the spring movement in 1939 was approximately one-third as large as in 1936, one-thirty-fifth as large as in 1937, and one-tenth as large as in 1938. Surveys of commercial beanfields in July showed that curly-top injury to beans was very light, ranging from 0 to 3.0 percent in the garden varieties and from 0 to 1.0 percent in the Great Northerns, a dry-bean

variety grown extensively in southern Idaho. Fall populations of the beet leafhopper in southern Idaho in 1939 were the lowest recorded since the institution of the extensive fall population survey in 1934 to obtain information on the number of leafhoppers that may enter the winter. Weather conditions early in October were generally favorable for fall germination of the fall and winter hosts of the beet leafhopper. A survey of the desert breeding areas in November revealed that a very sparse, though general, germination of the weed host of this insect had occurred in all sections of southern Idaho. Weather conditions up to the middle of December have been favorable for leafhopper survival.

Overwintering beet leafhoppers were found at 16 of the 21 points examined in the Billings, Mont., area in April, indicating a comparatively high winter survival for Montana. The infestation extended down the Yellowstone River Valley from Columbus to Custer, Mont., a distance of 96 miles. Excessive precipitation (9.05 inches), combined with low temperatures during the last half of May and the first 20 days of June, was evidently the important factor in limiting reproduction. A survey of beet fields in the Billings area in August revealed a very light infestation. A survey of beet fields for overwintered beet leafhoppers in the Nyssa, Oreg., and Toppenish, Wash., districts in the last few days of April showed the presence of overwintered leafhoppers in all fields examined. The infestation per field in the Oregon area ranged from 8 to 24, with an average of 15.6, and in the Washington area from 3 to 37, with an average of 13 leafhoppers per 100 feet of row. The infestation of overwintered beet leafhoppers in beet fields in south-central Idaho averaged 5.4 per 100 feet of row the first few days of May. (J. R. Douglas, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

In northern Utah the lack of precipitation in April and May 1938 reduced the germination of Salsola pestifer, the summer host plant of the beet leafhopper. In its place, Bromus spp. germinated very early in the spring and utilized the late winter precipitation. The stand of Russian thistle in the fall of 1938 was still reduced, but the population of the beet leafhopper was similar to 1936. The winter and spring host, Erodium cicutarium, germinated early in the fall and the leafhoppers made a direct transfer from the summer host. The population of the leafhopper on the Promontory Points breeding area in the spring of 1939 was much higher than in 1938. The percentage of viruliferous beet leafhoppers of the overwintering type was, however, about one-third as high as 1937 and two-thirds of that of 1938. The percentage of viruliferous beet leafhoppers from the first brood, or the brood that moves to the cultivated crops, maintained a low percentage of viruliferous hoppers, since the percentage was about half that of 1937 and one-third that of 1938. The peak of the local migration occurred about June 1. The damage to tomatoes was noticeably less than in 1938 or 1937. The damage to sugar beets was less than in 1938. (H. E. Dorst, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### BEET WEBWORM

From 1936 to 1938, inclusive, the beet webworm was a pest of considerable economic importance on beets in south-central Idaho. Approximately 4,000 acres of beets were sprayed each season. During this period the infestation occurred in practically the same localities year after year. The first flights of moths noted in 1939 were in the Castleford and Burley areas on May 10 and 11, respectively. Eggs were numerous in beet fields on June 3 and occasionally a worm was noted. Very few of these eggs hatched. From about June 10 to June 24, worms were



fairly common, and then decreased in numbers to about July 1. After this time only an occasional worm was noted throughout the remainder of the season.

#### MEXICAN BEAN BEETLE

The survival over winter of the Mexican bean beetle at Columbus, Ohio, was relatively high in the spring of 1939 (33 percent). No doubt high survival was general in the Ohio Valley, as the insect was numerous in the field at South Point and Cincinnati, Ohio, and at Louisville and Lexington, Ky. In southern Ohio beans that were not treated with insecticides were defoliated by the beetle, and insecticide sales in the Ohio Valley were higher than in previous years, according to some dealers. The beetle was numerous and injurious throughout eastern Kentucky, eastern Tennessee, and western North Carolina and South Carolina, and was numerous and injurious even in some locations in the coastal plain. (N. F. Howard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Note.—The Mexican bean beetle was reported in only moderate abundance generally, east of the Mississippi River, up to the last of June, with the exception of a few local heavy infestations in the South, especially in southern Georgia and across the State line in Gadsden County, Fla. Injury became evident late in June and thereafter until fall the insect reproduced rapidly and caused severe injury in many places. This pest was found for the first time this year in Sumter and Choctaw Counties, Ala., and Jefferson County, N. Y. The infestation in New York is some distance from previously known infestations.

#### TOMATO PINWORM

The tomato pinworm, which was much less abundant during the first part of last season, increased rapidly in numbers during September, October, and November. In the Yorba Linda area, where the pinworm caused 40- to 60-percent fruit injury by July 15, 1938, only 3 percent of the fruit was injured at the same date in 1939. By the end of the season (December 9), following several weeks of hot weather, the pinworm had built up sufficiently to cause 8 to 34 percent injury.

During July a survey of 10 representative fields in the San Pedro area of Los Angeles County showed the pinworm present in only 5 fields. The degree of injury ranged from 1 to 18 percent. In other areas of Orange and Los Angeles Counties and in northern San Diego County pinworm injury, which was usually absent in lowland areas, was not over 7 percent in the warmer upland areas by July. Later in the season only traces of pinworm injury were reported in lowland areas, while it built up to injurious numbers in late upland fields near San Fernando and Santa Ana. At San Fernando pinworm injury built up from 8 percent injury September 28, to 30 percent injury by December 4. In the upland areas near Santa Ana, a representative field showed an average of 58 percent of pinworm injury by November 21. (J. C. Elmore, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### PEPPER WEEVIL

Owing to cold weather during the winter of 1938-39, there was little nightshade and no berries in which the pepper weevil could breed early in spring. This resulted in a small winter carry-over of adults. The spring and early summer of 1939 were cool, so there was only a light infestation in most of the pepper-growing areas, and practically no commercial damage to the chili pepper crop. But, on account of a very warm fall, there was a gradual build-up of infestation and consequently heavy damage to fields of bell peppers. There is now (Jan. 1, 1940) a







● *Crioceria asparegi* (L.)  
○ *Crioceria duodecimpunctata* (L.)

General distribution - 1939

high weevil population which, unless checked before the winter is over, may cause heavy infestations in the 1940 crop. (Roy E. Campbell and J. C. Elmore, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### ASPARAGUS BEETLES

The common asparagus beetle has been reported for the last 2 years in much greater abundance than heretofore. It was reported from new localities in States known to be infested, and Alabama and Idaho reported first State infestations in 1938. This beetle was first reported as injurious in this country on Long Island, N. Y., in 1859, evidently having been introduced several years before. It spread northward and southward along the coast and by 1885 it was reported from Massachusetts to Norfolk, Va. By this time it had spread westward to Geneva, N. Y., through eastern Pennsylvania, and near Washington, D. C. There was evidently a commercial jump, for in 1884 the insect was reported from western Pennsylvania bordering Ohio, and in 2 or 3 years from the adjoining part of Ohio. From this focus of infestation the insect spread around the southern part of the Great Lakes, reaching northeastern Illinois in 1902 and southeastern Wisconsin in 1914. By 1920 its distribution included an area enclosed by a line from southeastern Minnesota, Iowa, Illinois, Kentucky, and Virginia to the Atlantic. In 1926 it was reported from Missouri. Its southwestern movement seems to have been slow. It was not reported from South Carolina until 1929. In 1937 it was reported from Georgia and in 1938 from Alabama.

In the western part of the United States it was reported as established in the San Francisco Bay district in 1906, and was later reported from north-central California. It was reported from southern California in 1928 and since that time has occasioned considerable injury. It was reported from Oregon in 1917. In 1924 it was reported from southeastern Washington, and was not seen west of the Cascades until 1936. Further spread in that part of the State was observed in 1939. The insect was reported from Colorado in 1915 and has spread very little. In 1937 it was observed near Great Salt Lake in Utah and in 1938 in southwestern Idaho.

The 12-spotted asparagus beetle, a rarer and less injurious species, occurs only in the northeastern one-fourth of the country. It was first discovered in the United States near Baltimore, Md., in 1881. From there it spread, especially to the north and west. To the south the spread was slower and it has not reached South Carolina, where considerable asparagus is grown. It was reported in the eastern part of the Great Lakes region in 1913 and moved westward, reaching Chicago in 1925 and eastern Iowa in 1931. It was found at St. Paul, Minn., in 1939. The attached map shows approximately the distribution.

#### BOLL WEEVIL

The total loss of cotton in the United States caused by the boll weevil was probably less in 1939 than any year since 1933, except 1938, and was about equal to the losses caused by the weevil during those years. In some States the weevils caused more damage in 1939 than for several years; in other States less damage. Boll weevils caused notably less damage in North Carolina, South Carolina, and northern Georgia during 1939 than in 1938, but they were more abundant and caused greater damage in Florida, southern Georgia, Alabama, and Mississippi in 1939 than in 1938. In Louisiana and Texas the weevil population and damage was apparently about the same in 1939 as in 1938. The Bureau conducted no cotton-insect investigations in Virginia, Tennessee, Arkansas, and Oklahoma in 1939 and had no opportunity to observe the boll weevil damage in those States.



The emergence of boll weevils in the hibernation cages and the number of weevils found in woods trash in Florence County, S. C., was higher in 1939 than in 1938, indicating that the weevil population in the fields would be higher; however, field studies made during the spring showed that for some reason this expected increase in the field population did not develop, and the number of weevils in the cotton fields was about normal. Conditions were favorable for cotton to grow fast and mature early and the boll weevil damage in South Carolina in 1939 was notably less than in 1938. In Madison Parish, La., the boll weevil population was rather light during the fall of 1938 because most of the cotton had been defoliated by cotton leaf worms. In the hibernation cages 1.16 percent of the weevils survived, as compared to 1.13 percent in the spring of 1938. This was a considerably higher survival than in 1933, 1935, and 1936, but much lower than in 1932, 1934, and 1937. However, examinations of Spanish moss and surface trash in March 1939 indicated the presence of more weevils than in 1938, and field counts made in May and June 1939 revealed that the weevil population in the field was greater than during any spring since 1935, but lower than during each year of the 4-year period 1932-35. Weather conditions during June 1939 were not favorable for the boll weevils, and early planted cotton developed with little weevil damage. In July and August conditions were more favorable for the weevils and late-planted cotton was seriously damaged, but in these fields the damage was not so great as would have been the case had not June been unfavorable for boll weevil increase.

At State College, northeastern Mississippi, the overwintered weevils in the cotton early in the season of 1939 were not so abundant as in the spring of 1938, when they were more numerous than in any spring since the laboratory was opened in 1934. However, conditions were favorable during June for boll weevil increase throughout northeastern Mississippi and, owing to the high boll weevil population and excessive rainfall, the cotton crop produced in that area was only about 30 percent of normal. This serious reduction in yield could have been largely avoided had more of the cotton been poisoned for boll weevil control. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### BOLLWORM

The bollworm was generally distributed in 1939 and caused more damage than usual in Mississippi and the other Southeastern States, except Florida, but did not cause as severe damage as usual in Texas and adjacent States, where it often causes serious losses. In Florida the bollworm infestations were spotted and the bollworm caused less damage to the cotton crop than usual. The total damage to cotton in the United States was probably less than usual.

This insect was reported as early as April 5 in the egg stage on alfalfa near College Station, Tex. Eggs were found on the terminal buds of cotton in Calhoun County, Tex., at the rate of 7 eggs per 100 terminal buds on June 3, 1939. A few worms were also observed feeding in the terminal buds of cotton at that time. They were reported to be causing some damage to cotton squares in Tift, Berrien, and Cook Counties, Ga., on June 17; at Troy and Hartselle, Ala., on June 21; and in Washington County, Miss., on June 24. Moths of the bollworm were observed at Florence, S. C., on June 17. During July bollworms were destroying squares and bolls in South Carolina, Georgia, Florida, Mississippi, and in many parts of Texas. The infestations were usually light, but were severe in isolated fields in Florida, Georgia, and Texas.

During August bollworms were more abundant than usual in Georgia, Florida, Alabama, Mississippi, and Arizona and caused serious damage in scattered fields in many counties in those States. Although the worms were reported from many parts of Texas and caused serious damage in some fields, they did not cause great losses over large areas, as in some years. During September the worms were reported from Georgia, Mississippi, and Texas, but in reduced numbers as compared to July and August. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### THE COTTON LEAF WORM

During 1939, the cotton leaf worm was less abundant and caused less damage than usual. It was first reported in the United States from Cameron County, Tex., on May 4 when a three-fourths-grown worm was collected at San Benito. The first leaf worms in Calhoun County, Tex., were observed on May 17 when two were taken from cotton 7 miles west of Port Lavaca. (In 1938 the first leaf worms recorded from the United States were taken in Calhoun County on May 2, the earliest record in this country since 1922.) The leaf worm population increased slowly and the moths did not spread as rapidly as in some years. After May 17 no leaf worms were reported from Calhoun County until one was observed on June 9 and several on June 22. On June 29 leaf worms about two-thirds grown were reported from the Brazos Bottoms near College Station, Tex. By July 19 they were beginning to appear in injurious numbers in several counties of central Texas, along the Brazos River, and it was reported that control measures were being applied in Nueces, Fort Bend, and Brazos Counties. Although leaf worms were reported in small numbers from other counties, they were less numerous than usual in Texas during June, July, and August. They were, however, reported by August 9 from Kaufman County in northern Texas, Runnels County in west-central Texas, and at Presidio in the Big Bend. On August 16 severe ragging of cotton plants was reported in the Coastal Bend area, and control measures were being used generally in the Upper Coastal area and as far north as McLennan County. By August 19 most of the cotton in Calhoun County had been defoliated, except the fields that had been protected by poison. At Presidio in the Big Bend, only slight defoliation was reported. On August 26 the leaf worms were numerous in late-planted cotton in McLennan, Falls, and Limestone Counties, but the damage was not very serious as most of the cotton had been planted early. By September 2, nearly all late-planted cotton in these three counties was infested. By August 30 the worms were reported in Dickens County, northwestern Texas, and in Crosby, Lubbock, and Lynn Counties, on the Southern Plains. By September 9, most of the cottonfields in Presidio County had been stripped by the worms.

In 1939 the cotton leaf worm moths apparently entered this country through Florida, as well as Texas, as that was the second State from which they were reported. Heavy infestations were reported from Seffner in Hillsborough County on July 8, and from Trenton in Gilchrist County, Fla. On July 15 they were observed in Putnam and Union Counties and were causing damage in Gilchrist County. On August 12 they were reported as occurring in small numbers in Alachua, Union, Marion, and Lake Counties but seemed to be held in check by some natural control. The Georgia infestation apparently came from Florida but the worms were not reported from Georgia until August 25 when a few were found in Echols County, near the Florida State line.

The moths probably spread from Texas into Louisiana. From that State the first leaf worm, a fourth-instar larva, was reported from Tallulah, Madison Parish, La., on July 16 and by August 23 the worms were abundant in some localities



in northern Louisiana. By September 23 from 50 to 75 percent of the cotton was defoliated. The moths probably spread from Florida into Mississippi, as the first leaf worms in that State were found in the Gulf Coast region in George County on July 29, and later in Jackson County. On August 14 they were reported from Tate and Washington Counties in the northern and western parts of the State and from Oktibbeha County in the northeastern part of the State on August 17. These infestations were probably started by moths from Louisiana as they were closer to the infested areas in Louisiana than to those in southern Mississippi, and also as most of the worms in the George County infestation were reported to have been destroyed by parasites.

The first leaf worms in Arizona in 1939 were found at Sahuarito, Pima County, on August 28, exactly 1 month later than in 1938. (They had previously been reported from Marana on August 17 but this report was not officially verified.)

Leaf worms were not reported in South Carolina and Tennessee until September and during October isolated and scattering infestations were reported from those States. Cotton leaf worm moths were reported at lights in Michigan on September 15 and in large numbers by September 22. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### COTTON FLEA HOPPER

Cotton flea hoppers caused less damage than usual in 1939. They were first reported on cotton on April 3, in Calhoun County, Tex. In June they were reported from many counties in Texas, Oklahoma, Louisiana, Mississippi, South Carolina, and Georgia, but only in limited areas in Texas, Oklahoma, and Mississippi were they numerous enough to cause serious damage. During July and August they were reported as present in South Carolina but doing no damage, and as causing some damage in limited areas in Mississippi, Louisiana, Oklahoma, and Texas.

Hibernation studies in Calhoun County, Tex., showed that the peak of emergence in 1939 was on April 21, 7 days earlier than in 1936 and 1938, but later than in 1933, 1934, 1935, and 1937. During the week ended April 22, 62.6 percent of the seasonal emergence occurred. The emergence from hibernation in Calhoun County during 1939 averaged 19.45 flea hoppers per cotton plant. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### GLADIOLUS THRIPS

The status of the gladiolus thrips during 1939 has not changed from that of the last two preceding years. Judging from the nature of inquiries received, it is still a serious pest in the small homeyard plantings, but commercial growers seemingly are more familiar with its habits and injuriousness and therefore are better able to cope with it. No new localities have been recorded. (C. A. Weigel, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### ROSE MIDGE

Only a few reports were received on this pest during 1939 by the Bureau of Entomology and Plant Quarantine. It is felt that the dearth of inquiries is due to the fact that this insect has had considerable publicity in the American Rose



Annual for 1939, the Yearbook of the American Rose Society. As a result, rose growers are now more familiar with this pest and are better able to cope with it, so that fewer inquiries are being received. This does not mean that this pest is less injurious to garden roses than formerly, because in observations conducted on an infestation in Washington, D. C., the rose midge caused such severe injury that the grower, a leader among the local rose enthusiasts, was unable to enter any roses for the 1939 Annual Rose Show. In the past he has been able to grow and enter sufficient blooms to carry away several first prizes. By the end of August practically all of the new growths were attacked, resulting in almost complete destruction of the subsequent buds. Activity ceased the end of October. The infestation on Long Island was apparently brought under control, the grower reporting that a successful crop was grown and harvested. A record of an infestation of 8 years' standing (from 1931) was reported in the Rose Annual for 1939 (p. 113). This infestation was at Lovell, Wyo., apparently a new locality record for this insect on outdoor roses. (C. A. Weigel, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### PERIODICAL CICADA

Brood XIII of the periodical cicada, the original range of which included the northern half of Illinois, eastern Iowa, southern Wisconsin, northwestern Indiana, and southwestern Michigan, appeared in isolated spots over much of its range. In 1939 it was very abundant in oak wood west and south of Chicago and extending into northwestern Indiana. Of the old records in the Eastern States, of which there is one in Pennsylvania, two in Maryland, two in West Virginia, one in Virginia, and one in Kentucky, not one was confirmed; however, the insect was observed in other localities in all of these States, except West Virginia and Kentucky, and also from northeastern Ohio. The records made in 1939 are as follows, counties being underscored:

- Illinois: Northern half of State, north of line drawn from central Hancock County to central Vermillion County. Cook, parks in the suburbs of Chicago; in oak wood along on highway No. 34, westward through Du Page, Kendall, La Salle, Bureau, Henry, and Rock Island Counties.
- Indiana: Lake; Laporte; Porter.
- Iowa: Jackson; Linn, Cedar Rapids; Scott, Davenport.
- Maryland: Calvert, near Plumpoint; Prince Georges; Beltsville, Branchville, Catonsville, College Park; Washington, Hancock.
- Ohio: Cuyahoga, Brecksville; Stark, Canton.
- Pennsylvania: Near crest of the mountain on highway 83 between Schubert, Berks County, and Summit Station, Schuylkill County.
- Virginia: Augusta; Patrick, Stuart; Montgomery, Blackburg; Roanoke, Glenvar, Roanoke; Smyth, Chilhowie; Wythe, Grahams Forge.
- Wisconsin: All southern counties; Crawford; Dodge; Richland; Rock.

## GYPSY MOTH

The hatch of egg clusters of the gypsy moth was much more pronounced than it was in 1938. Egg clusters collected and observations made in the field over quite an extended area showed a good hatch in most localities. Very little wintorkill was noted and a high percentage of hatch was present in many sections of the infested area. Hatching was late and spring mortality low in 1939.

In Maine there was a considerable increase in defoliation in 1939, an increase of about 60 percent over that in 1938, the total being greater than in any other previous year. In New Hampshire there was an increase of approximately 100,000 acres, all gradations of defoliation showing a marked increase. In Vermont a great increase was noted, more defoliation being recorded in 1939 than the total recorded for the last 15 years (1925-39, inclusive). In Massachusetts there was a slight decrease in defoliation as compared with that recorded in 1938. In some sections a marked increase was noted, especially in Plymouth, Norfolk, and Bristol Counties, with a slight increase in Dukes County. There was a slight decrease in Worcester, Barnstable, and Franklin Counties, and a large decrease in Essex, Middlesex, Hampden, and Hampshire Counties. There was over a 50-percent decrease in defoliation in the section between the Connecticut River and the barrier zone. In Rhode Island there was a big decrease in defoliation recorded. In Connecticut there was a marked increase in defoliation in 1939 over that recorded in 1938. (J. N. Summers, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## BROWN-TAIL MOTH

During the summer of 1939 there were not many reports of defoliation by this insect, although in some sections of southern New Hampshire a considerable amount of complete defoliation was noted. According to records received from Maine, New Hampshire, and Massachusetts, the total number of brown-tail moth webs cut by State or local crews during the winter of 1938-39 was considerably greater than the total recorded during 1937-38. In Maine the number increased from 116,000 in 1937-38 to 974,000 in 1938-39. This was due partly to an increase in infestation and partly to an increase in the number of men employed on the work. With about the same number of men working in New Hampshire and Massachusetts for the 2 seasons, the number of webs cut in New Hampshire during the 1938-39 season, increased about 100 percent over 1937-38; in Massachusetts the number of webs cut during 1938-39 increased 44 percent over the previous season. (J. N. Summers, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## SATIN MOTH

Most of the defoliation noted in the New England area during 1939 was confined to single or groups of poplar trees. In Maine the infestation was general but light in most localities. In New Hampshire feeding was light, except in a few localities. In Vermont and Massachusetts the feeding was light; and in Connecticut only a small amount of noticeable feeding was noted, although in 1 locality a group of 100 large roadside poplar trees were affected. (J. N. Summers, Bureau of Entomology and Plant Quarantine, U. S. D. A.)



## WESTERN PINE BEETLE

Following three seasons of relatively light losses, an increase in activity of the western pine beetle (Dendroctonus brevicornis Lec.) developed during the 1939 season in California. This increase is aggressive and disturbing in several important areas, notably on the west side of the Sierra Nevada and Cascade Mountains in northern California. In contrast to 1937, when but 350 million board feet were killed, it is tentatively estimated that the 1939 losses will amount to 550 million board feet. In the ponderosa pine stands of southern Idaho the western pine beetle is responsible for some loss, although for the most part the infestations of this beetle can be considered as normal.

The western pine beetle was more active during 1939 than in the previous year in spite of better moisture conditions and a general improvement in tree health and vigor in Washington and Oregon. A check of 190 320-acre sample plots in eastern Oregon and Washington showed an increase of 6 percent in the number of ponderosa pines killed. The Deschutes subregion of central Oregon showed a 54-percent increase. Control operations were started on the Fremont, Deschutes, and Ochoco National Forests and were continued on the Warm Springs Indian Reservation, as well as on private lands in southern Oregon.

## THE MOUNTAIN PINE BEETLE

Epidemic infestations of mountain pine beetle (Dendroctonus monticolae Hopk.) in sugar pine have been heavier than for any season during the last 10 years in California. These infestations are occurring in areas where recently there have been no similar, serious, extensive outbreaks. The mountain pine beetle continued to show signs of aggressiveness in Mount Rainier National Park, where infestation increased slightly over that of 1938. A maintenance control program is in effect in the park and it is hoped that with intensified efforts the infestation will be reduced to an endemic status by 1940. During the last season there has been no material change in the status of the bark beetle infestations of the Northern Rocky Mountain region. The mountain pine beetle continues to take an annual toll from the white pine forests of Idaho and Montana of at least 0.7 percent of the total volume. Although responsible for some losses of whitebark pine along the higher elevations of the Continental Divide, there are only light scattered infestations of the mountain pine beetle within the lodgepole pine areas. Infestations of the mountain pine beetle in limber pine and lodgepole pine are still serious on the Washakie National Forest, over a million infested trees being reported.

## DOUGLAS FIR BEETLE

The Douglas fir beetle (D. pseudotsugae Hopk.) occurs in epidemic numbers in many Douglas fir stands, in the Northern Rocky Mountain region, where severe losses have occurred and are still occurring. The insect became epidemic in the Douglas fir stands along the central and southern coastal area of Oregon, where numerous groups of trees were killed on the Siskiyou National Forest and the surrounding area. This outbreak is considered as a typical local "flare-up," characteristic of this insect in the region west of the Cascade Range. Presumably the population built up in trees killed by fires that burned over this country for the last several years. No control program is considered feasible. The widespread outbreak of the Douglas fir beetle in western Wyoming is still maintaining itself, where it is estimated that there are 500,000 infested trees on the Wash-



skie National Forest alone. In other parts of the Rockies there appears to be no appreciable decline.

#### ENGRAVER BEETLES (IPS SPP.)

Outbreaks of engraver beetles, Ips oregoni Lec., have been a feature of the 1939 infestations in ponderosa pine in California. Extensive top killing and group killing of pole stands has occurred, both in cut-over reserves and in virgin forests. These outbreaks may be of importance because in the past they have been found to be the forerunner of more sustained and serious infestations of Dendroctonus. Extensive group killing of ponderosa pine reproduction by the Oregon pine engraver (Ips oregoni Eich.) was noted on several logging operations on and near the Ochoco, Malheur, and Whitman National Forests, of eastern Oregon. This is the most severe outbreak of I. oregoni that has occurred in the Northwest since 1931, when there was a similar infestation in the vicinity of Klamath Falls, Oreg.

There has been a marked increase in the numbers of ponderosa pine infested by Ips oregoni Lec. and Ips ponderosae in the Black Hills of South Dakota. In many places they are killing trees in groups of ten or more. An epidemic by Ips engraver beetles and the southern pine beetle on 6,000 acres of privately owned lands in southeastern Jasper County, Tex., killed 24 million board feet of mature loblolly pine, of which 16 million board feet were salvaged. Smaller infestations of pine timber by Ips engraver beetles occurred in northern Florida, southern Louisiana, the Gulf coast of Mississippi, and in southern Arkansas.

#### BLACK HILLS BEETLE

The infestations of the Black Hills beetle in ponderosa pine in the central Rocky Mountain region have in general declined appreciably during the last season, owing to extensive control work and to apparently natural factors. In Utah there is still a serious infestation in ponderosa pine on the Powell National Forest, where it is estimated about 12,000 trees will be treated this winter. On the Wasatch National Forest a serious infestation was found to be developing in lodgepole pine.

#### THE SOUTHERN PINE BEETLE

Dendroctonus fontalis Zimm., which was seriously damaging pine timbers in the Coastal Plain of Virginia and North Carolina in 1938, subsided there to endemic numbers. However, in the mountains of North Carolina and Tennessee and in portions of the Piedmont of the Carolinas, this bark beetle was very destructive, killing large areas of shortleaf and pitch pines, especially in the Pisgah National Forest and in the Great Smoky Mountains National Park.

#### THE SMALLER EUROPEAN ELM BARK BEETLE

A map showing the known distribution of the smaller European elm bark beetle (Scolytus multistriatus Marsh.) in the United States at the end of 1937 was included in the Insect Pest Survey Bulletin, Summary for 1937. Additional distribution records were given in the Bulletin Summary for 1938. Certain records made by Government and State workers during 1939 are of interest because they add information to the known distribution of the beetle in this country. The finding of

the insect in and around Rochester, N. Y., is of most interest, as this area is so far removed from territory previously known to be infested. Other interesting records have to do with Columbus, Ohio, Sag Harbor, Long Island, N. Y., and Concord, N. H. S. multistriatus has also been taken during the year at several places in Connecticut, which extends the known infested area in that State somewhat farther east along Island Sound. The number of S. multistriatus adults collected from elm trap trees at six New Jersey locations in 1939 was less than the number collected at the same locations in 1938 under similar collecting methods.

#### SPRUCE BUDWORM

Outbreaks of the spruce budworm in the Douglas fir and white fir stands in central and southern Colorado are spreading to new areas and in many of the old areas the defoliation has become so severe that many trees will be killed. Infestations in ponderosa pine have been found in new areas but in the older outbreak areas the defoliation does not appear to be as severe as the previous year.

#### PANDORA MOTH

The epidemic of the pandora moth (Coloradia pandora Blake) in lodgepole pine on the Arapaho National Forest, in Colorado, was greatly reduced during the last year by three natural factors. An unusually cold winter killed many of the second-instar larvae that overwinter on the branches. A wilt disease of the larvae was effective in reducing the survivors of the winter. Abnormally high temperatures and dry, hard soil killed many of the mature larvae while they were attempting to enter the soil to pupate in July.

#### HEMLOCK LOOPER

The severe epidemic of the hemlock looper (Ellopiia fiscellaria Guen.), which in 1937 appeared throughout the Alpine fir stands of northern Idaho and western Montana, was reduced through natural agencies to a normal condition in 1939. A number of parasites played a part in this reduction of which Phaenoldella n. sp. was most important. Although the first known record of this insect within the northern Rockies, the presence of its natural enemies indicates that it is indigenous to the region.

#### DOUGLAS FIR TUSsock MOTH

As predicted last year, infestation of the Douglas fir tussock moth (Hemerocampa pseudotsugata McD.) increased materially. In the infestation centering about Radio Mountain of the Malheur National Forest many Douglas firs and true firs were completely defoliated and are expected to die. Understory ponderosa pine was also defoliated where infestation was heaviest. In this area a remarkable drop in population occurred during the late larval stages, which will probably result in a light infestation in 1940. An extensive new outbreak of this defoliator was discovered near Spray, Oreg., on the Umatilla National Forest. There, only partial defoliation was observed but probably there will be an increase next season.

#### GREAT BASIN TENT CATERPILLAR

An outbreak of the great basin tent caterpillar (Malacosoma fragilis Stretch) became widespread on the Deschutes National Forest, Oreg., where it caused severe defoliation of bitterbrush (Purshia tridentata), the most important native browse plant of the western ranges. This infestation was first observed in 1937 and de-



veloped rapidly during 1938 and 1939 to the point where control measures seem impractical. The last previous epidemic in this area occurred during the period 1928-30.

## SCREWORM

Losses from the screwworm in the Southwest during 1939 were about average and were somewhat less than in 1938. Less damage was noted, particularly in Arizona, New Mexico, Oklahoma, and Kansas and also in central and eastern Texas. Louisiana had little trouble with the pest and apparently Mississippi was not invaded at all. In Kansas there was considerable trouble early in the spring, owing to infected cattle being shipped into the State from southern Texas, but after June 1 the infestation practically disappeared. In the vicinity of Menard, Tex., a close check on several ranches indicated an infestation of 3.57 percent of all livestock in 1939 as compared with 3.27 percent in 1938.

The overwintering of the screwworm fly in numbers in Texas during the winter of 1938-39 was restricted mostly to a small area in Kinney and Val Verde and the southern part of Edwards Counties by very dry conditions during the latter part of the summer of 1938, and continuing through the winter and spring of 1939. A winter peak population of flies (153 females); as determined by trapping, was recorded at Brackettville, Tex., in December 1938. On the escarpment of the Edwards Plateau in Texas comparative populations of screwworm flies for the period January 1 to April 15 in 1938 and 1939 were 248 and 39, respectively. The spring population in 1939 reached a peak of 1,044 females in the trapping period, which ended June 30 at Brackettville. Migration is indicated to have reinfested the area east on the escarpment about 1 month later than normal and a light infestation reached Lufkin, Tex., in the last days of August. Migration north into the Oklahoma area was only slightly slower than normal. The flies reached Buffalo, Okla., late in August, but none of the area south to the Balcones escarpment was heavily infested, there being practically no cases in much of the area during the entire summer.

The very hot, dry summer of 1938 practically exterminated the fly south and east of Uvalde, Tex., on the Gulf Coast Plain to near the Gulf coast. This area may have been reinfested during 1939 partly from the overwintering area at Brackettville and partly from the overwintering area about San Perlita, Tex., on the lower Gulf Coast Plain. None of this area had any considerable spring peak. The highest peak of 196 females was reached on April 15 at San Perlita. In the general area between San Perlita and Brackettville areas no place is indicated to have had more than 50 adults per trap period during the summer or fall. A high fall peak was built up along the escarpment. This peak was reached with 1,356 females per trapping period north of Brackettville on October 15, and for the eastern escarpment at Kerrville on the same date with 697 females. The peak population on the lower Gulf Plain was 70 females at San Perlita on October 30, the number decreasing to 35 on December 1. Other areas had less than 10 flies per trap period.

The decrease on the escarpment has been slightly greater this fall than last--from 4,077 adults to 134 in the general trapping area from October 1 to December 1--practically 97 percent. Last year the decrease was from a peak of 1,736 females to 65, or 96 percent, for the same period. At the first of December, 1939, there was a general infestation of about normal over the entire lower escarpment and a general light infestation over the entire Gulf Plain. Numerous screwworm infestations occurred among new-born calves during the latter half of December in the Brady, Tex., area.



In the Southeast, weather conditions were favorable during the fall and winter of 1938 for the screwworm to build up and overwinter in Florida and southern Georgia. Reports of screwworm cases during the winter months were received from Cook, Ben Hill, Bacon, Lowndes, and Ware Counties in Georgia, and winter cases were more or less general over Florida, except in the extreme western part. The pest began spreading northward and westward early in the spring. In Tift County, Ga., cases were reported the first week in April and in Clinch and Brooks Counties heavy infestations were reported in April and May. Later in the summer practically the entire State was infested and many cases occurred in South Carolina, particularly in the coastal region. In the upper Coastal Plains and in the Piedmont section the pest was less abundant than during previous years when it was present in the State. Alabama was also very generally infested and considerable loss was sustained especially in the southeastern third of the State. No cases were reported from North Carolina or Tennessee.

All are agreed that the screwworm was more abundant and destructive in Florida, Georgia, and the lower Coastal Plains of South Carolina than during the three preceding years. Many stock owners compared the infestation to the extreme one which existed in 1934 and 1935. A number of complaints were received from Florida, Georgia, and South Carolina of depredations of the screwworm on wildlife, particularly deer. (F. C. Bishopp, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### AMERICAN DOG TICK

In general, the American dog tick (Dermacentor variabilis Say) appeared to be about normal in abundance in the Eastern States during 1939. In some areas it was reported to be much less numerous than during the previous year, but in others it was clearly more abundant. On Cape Cod and on Martha's Vineyard, Mass., the adults of this tick were from two to five times as numerous at the peak of the season in May and June 1939 as in 1938, although activity of adult ticks ceased somewhat earlier in 1939 than in 1938.

Rocky Mountain spotted fever, which is transmitted by this tick in the central and eastern parts of the country, showed a distinct increase, according to reports published by the United States Public Health Service in Public Health Reports. The number of cases for the entire season of 1938 in the States where this tick is the dominant carrier was 242, as compared with 347 in 1939, up to the week ended December 7. The increase in the number of reported cases in New York (2 in 1938 to 10 in 1939), Pennsylvania (2 to 15), and Maryland (42 to 68) is particularly striking. The number of cases reported in the Western States, where the principal carrier is D. andersoni Stiles, also showed an increase, from 118 in 1938 to 169 in 1939. Few data regarding the relative abundance of this tick are at hand. (F. C. Bishopp, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## NOTES ON SUGARCANE PESTS IN HAWAII FOR THE YEAR 1939

by O. H. Swezey

Anthonomus orientalis Th. has been comparatively uncommon throughout the year. Nowhere have the grubs been in sufficient quantity to cause any damage in canefields. There has not been any extension of the infested area in cane lands, but the light infestation previously noted in pineapple lands adjacent to the upper canefields of one plantation has increased somewhat, and was recently reported as doing serious damage to some of the ratoon pineapple plants. As in recent years, the introduced parasites have been the chief factors in control of the pest in canefields.

Damage by Rhabdocnemis obscura Boisd. has been notably on the decline of late. This may be ascribed to better control of rats (cane eaten into by rats being a favorite situation for the multiplication of the borer), the increased use of varieties of cane having a harder rind, and much elimination of holdover crops resulting from quota restrictions. At the same time the introduced New Guinea tachinid fly, Ceromasia sphenophori Vill., has continued its valuable assistance in checking the pest.

Perkinsiella saccharicida Kirk. has been rare throughout most of the Hawaii cane lands in 1939, owing to control by its numerous introduced natural enemies, most important of which is the egg-sucking bug Cyrtorhinus mundulus Bredd.

The sugarcane leafroller (Omiodes accepta Butl.), which had become of slight importance in the last several years, again came into prominence in 1939, though no measurable losses are reported. The few plantations noticeably affected were situated at lower elevations and in drier situations than where the former severe infestations occurred. It is possible that some of the newer seedling varieties being used are more susceptible to attack, or perhaps methods of culture may have resulted in the cane being more attractive to the pest. As usual, parasites have been active in checking the pest, the chief one being the braconid Microbracon omiodivorum Terry.

The nutgrass armyworm (Laphygma exempta Walk.) became epidemic on all the islands and on many of the plantations early in 1939, and considerable damage was done to fields of young cane. The unusual epidemics in some cases were found to be correlated to presence of grass areas adjacent to canefields, or to insufficient control of grass in the fields. The infestations soon came to an end at which time the natural enemies were found to have increased to an abundance. Considerable attention was given to the artificial spreading of the egg parasite Telenomus nawali Ashm. This parasite has become increasingly important in recent years.

The Chinese grasshopper (Oxya chinensis Thun.) has continued to be scarce, with no field outbreaks, undoubtedly owing to the presence of the introduced Malayan egg parasite Scelio pemberton Timb.

The black widow spider (Latrodectus nactans F.) continues to be a menace in several of the sugarcane areas, as well as in other situations. At times the mud dauber wasps store up considerable numbers of them in their nests. An egg parasite, Baeus californicus Pierce, was introduced from California in August and reared by the thousands for distribution, in the hopes of its becoming established and serving as a check to the spider.



Vol. 19

Summary for 1939

Supplement  
to No. 10

## EUROPEAN CORN BORER

The seasonal occurrence of the European corn borer in 1939 was about average over the range of its distribution in the United States, a partial second generation developing in the Lake States, two generations in New England, a small partial third generation in New Jersey, and three generations on the Eastern Shore of Virginia. First oviposition records for selected localities were as follows: Toledo, Ohio, June 6; Waltham, Mass., June 5; New Haven, Conn., May 29; Moorestown, N. J., May 25; Onley, Va., May 10.

In addition to the previous known distribution of the insect observations principally by State personnel provided records of corn borer occurrence in 1939 in the following counties: Dodge, Green Lake, Jefferson, Oconto, Outagamie, Shawano, and Waupaca in Wisconsin; Cook, Du Page, Kankakee, Lake, and Will in Illinois; Chester, Delaware, Lancaster, and Montgomery in Pennsylvania; Kent and New Castle in Delaware; Lancaster, Nansemond, and Richmond in Virginia; and Camden, Currituck, and Pasquotank in North Carolina. The Illinois and North Carolina infestations are the first records of occurrence of the corn borer in these States.

The greater portion of the known area of corn borer infestation was included in the annual fall survey of abundance in 1939, conducted by the Bureau in cooperation with various interested States, although comparisons of populations between 1938 and 1939 are restricted to districts also surveyed in the former year. In these districts, a general increase occurred in Indiana, while marked decreases occurred in Connecticut and New Jersey. In Connecticut, however, first-generation oviposition and infestation were particularly heavy, the factors contributing to the decrease in the fall population having been expressed after the completion of the first generation. The remaining districts for which comparable data are available carried similar populations for the 2 years, minor increases and decreases appearing scattered over the territory. Except for critical areas in eastern Michigan, in Ohio extending southwest of Lake Erie, and in the Eastern States extending from Massachusetts to New Jersey, borer populations in general averaged less than 100 borers per 100 plants. The greatest abundance was found in southern New England, where 5 counties in eastern Massachusetts, 2 in central and 2 in eastern Connecticut, and 4 in Rhode Island averaged over 500 borers per 100 plants, and in the tip of the "thumb" section of Michigan, where 1 county had a population of 595 borers per 100 plants. Selected fields in New Jersey continued to carry heavy borer concentrations with averages of 16 to 40 borers per plant.



Corn borer infestation in early market sweet corn in 1939 was most severe in New Haven County, Conn., where half of the fields surveyed averaged 20 or more borers per plant, and in Ulster County, N. Y., where half of the fields averaged 10 or more borers per plant. In New Haven County the average number of borers per plant was 19.8 and in Ulster County 12.6. The greatest increase of the pest in sweet corn occurred in Burlington County, N. J., where an average of 0.5 borer per plant in 1938 changed to 4.2 borers in 1939. Less than half as many borers infested the crop in Lucas County, Ohio, in 1939, when the average number per plant was 8.2, as in 1938, when it was 17.5. The heaviest population in early market sweet corn in any of the 4 counties surveyed in southwestern Maine in 1939 was in York County, where there were 125 borers per 100 plants.

The borer was less abundant in 1939 than in 1938 in white potatoes grown in central Connecticut and Massachusetts. Observations in 47 dahlia plantings in New Jersey, Long Island, and the lower Hudson River Valley showed 2 plantings, both in New Jersey, to be heavily infested, 4 with medium, 10 with light, and 12 with negligible infestations, the remaining 19 fields having no infestation. The corn borer is just becoming evident to growers of large plantings for commercial cut flowers in southern New Jersey and, while the damage in 1939 was found to be negligible in most cases, the pest could be found in most of the plantings in which it was not observed in previous years.

Extremes in moisture conditions characterized the summer of 1939 in practically all sections infested by the borer, whereas fluctuations in temperature were, in general, less pronounced. April was the fourth consecutive wet month in New Jersey and was also wet farther south along the Atlantic coast. The month of May was generally dry from Indiana east to the New England coast and south through New Jersey to the Eastern Shore of Virginia. June precipitation was excessive in Ohio, Michigan, and Indiana, while in the more eastern States it ranged from slightly above to slightly below normal. Although moisture conditions in July were about normal in Ohio, Michigan, and Indiana, the weather that month in New York State and east through most of New England and New Jersey developed into a serious drought. In New York dry weather continued into August and in Ohio that month was one of the driest Augusts on record. August was a month of excessive rainfall in New Jersey and New England.

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THE INSECT PEST SURVEY  
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Aedes vexans (Meig.) -----	3	97
	4	172
	8	520
Aeoloplus lacinnus -----	4 (Sup.)	196
Aeoloplus tenuipennis Scudd. -----	4 (Sup.)	259

Aeoloplus turnbullii Thos. -----	4 (Sup.)	189, 210-242
Aeoloplus turnbullii bruneri Caud. -----	4 (Sup.)	195, 196, 199, 211
		213, 228, 230, 235
		243, 245, 255, 267
Aeoloplus turnbullii turnbullii Thos. -----	4 (Sup.)	195, 196, 224, 226, 228
		239, 251, 253, 267, 269
Aeolus dorsalis (Say) -----	4	118
	5	280
Aerochcreutes carlinianus carlinianus Thos. -	4 (Sup.)	224
Aeropedellus clavatus Thos. -----	4 (Sup.)	196, 218, 224, 239, 251
Ageneotettix deorum (Scudd.) -----	4	114
	4 (Sup.)	189, 196, 208-209
		211, 213-226, 228-230
		232, 235, 238-245
		250-255, 259-261
		264-269
Ageneotettix deorum deorum (Scudd.) -----	4 (Sup.)	205, 206, 208, 209, 215
		216, 264, 265
Agonoderus lecontei Chaud. -----	4	128
	6	365
	7	434
Agonum maculicollis Dej. -----	3	102
Agrilus anxius Gory -----	4	161
	5	327
	6	400
	7	464
	8	509-510
	9	546, 573
Agrilus difficilis Gory -----	1	17
Agrilus rubicola Abeille de Perrin -----	4	171
Agrilus ruficollis (F.) -----	1	9
	3	78
Agrictes mancus (Say) -----	5	280
Agromyza simplex Loew -----	4	151
Agromyza virens Loew -----	3	95
Agromyzidae -----	4	150
Agrotis orthogonia Morr. -----	3	65
	4	121
	9	549
Alabama argillacea (Hbn.) -----	4	156
	5	321
	6	393-394
	7	420, 458-459
	8	485, 505-506
	9	569-570
	10	639-640
Aleurodes azaleae (B. & M.) -----	5	339
Aleurodidae -----	5	315
	8	507
	9	579
Aleuroplatus plumosus (Quaint.) -----	4	169
Allocoris pulicaria (Germ.) -----	5	338

<i>Alsophila pometaria</i> (Harr.)-----	1	16
	4	158
	5	323
	6	397
<i>Altica chalybea</i> Ill. -----	4	140
	5	302
<i>Altica torquata</i> (Lec.) -----	3	79
<i>Altica ulmi</i> (Woods) -----	1	16
	5	329-330
	9	574
<i>Alypia octomaculata</i> (F.) -----	7	471
<i>Amblyomma americanum</i> (L.) -----	3	98
	4	174
	7	478
	9	586
<i>Amblyomma maculatum</i> Koch -----	2	56
	3	98
	4	175
	5	346
	6	416
	7	478
	8	522
<i>Amblyteles brevicinctor</i> (Say) -----	8 (Sup.)	534
<i>Amitermes perplexus</i> Banks -----	8	524
<i>Amphitornus coloradus</i> (Thos.) -----	4 (Sup.)	196, 211, 224, 228, 239
		241, 243, 251, 253, 267
<i>Anabrus simplex</i> Hald. -----	3	63
	4	111, 116
	5	277-278
	6	355
	7	424
	9	547
	10	628
<i>Anacentrinus deplanatus</i> (Csy.) -----	8	491
<i>Anacentrinus subnudus</i> Buch. -----	2	36
<i>Anaphothrips obscurus</i> (Mull.) -----	5	272, 290-291
	6	414
<i>Anarsia lineatella</i> Zell. -----	4	137
	6	372
<i>Anasa tristis</i> (Deg.) -----	1	13
	2	46
	3	84
	4	149
	5	311
	6	387
	7	451-452
	8	501-502
	9	565
<i>Anastrepha ludens</i> (Loew) -----	2	42
<i>Ancyliis comptana</i> (Froel.) -----	4	153
	5	315
	6	390-391
	8	503



Andricus cornigerus O.S.-----	9	576
Andricus coronus Feutm. -----	4	165
Andricus topiarius Ashm. -----	1	17
Anisandrus pyri Peck -----	7	442
Aniseta rubicunda (F.) -----	7	421, 467
	8	512
	9	575
Aniseta senatoria (A. & S.) -----	8	513
Anomala binotata Gyll. -----	3	89
Anomala orientalis Wtrh. -----	5	279
	7	427
	10	648
Anopheles atropis D. & K. -----	2	54
Anopheles maculipennis Meig. -----	3	997
	8	520
Anopheles punctipennis Say -----	3	97
	8	520
Anthonomus costulatus Suffr. -----	6	377
Anthonomus eugenii Cano -----	1	13
	3	86
	4	113, 152
	6	391
	10	636-637
Anthonomus grandis Poh. -----	1	14-15
	2	48
	3	86-87
	4	113, 155
	5	273, 317-320
	6	352, 392-393
	7	420, 455-457
	8	485, 504-505
	9	568-569
	10	637-638
Anthonomus grandis thurberiae Pierce -----	8	505
Anthonomus scutellaris Lec. -----	7	442
	8	495
	9	559
Anthonomus signatus Say -----	2	46-47
	4	152
Anthrenus scrophulariae (L.) -----	1	23
	6	417
	7	480
	8	525
Anthrenus verbasci (L.) -----	1	23
	7	480
Anticarsia gemmatilis (Hbn.) -----	7	429, 436
	8	485, 488
	9	545, 550-551
Antipus laticlavus (Forst.) -----	6	411
Anuraphis bakeri (Cowen) -----	6	366

Anuraphis roseus (Baker) -----	1	9
	3	75
	4	136-137
	5	295, 296
	6	371
	7	422
	10	632
Anurogryllus muticus (Deg.) -----	4	157
Aonidiella aurantii (Mask.) -----	4	142
	5	303
Aphalara calthae (L.) -----	6	383
Aphelinus mali (Hald.) -----	3	75
	7	422
	8	493
Aphelinus sp. -----	3	71
	5	292-293
Aphiidae -----	2	46, 47, 53
	3	61, 74, 83
		85, 86, 88, 91
	4	112, 135-137, 153
	5	272, 295-296, 313, 327
	6	352, 360, 371, 374-375
		377, 386, 403
	7	421, 422, 451, 460
	8	493, 501, 502, 507
	9	570, 573
Aphis forbesi Weed -----	2	47
	8	503
Aphis gossypii Glov. -----	2	51
	3	88
	4	156
	5	312
	7	452, 460
	8	502, 507
	9	570
Aphis illinoensis Shim. -----	9	559
Aphis maidis Fitch -----	6	362
	7	419, 433
	8	491
Aphis pomi Deg. -----	3	74
	4	135, 136, 137
	5	296
	6	371
	7	422, 439
	10	632
Aphis rociadae Ckll. -----	5	340
	6	410
Aphis rumicis L. -----	1	12
	2	45, 53
	4	171
	6	385
Aphis sambucifoliae Fitch -----	3	90

<i>Aphis spiraecola</i> Patch -----	1	10
	2	42
	3	61, 79
	4	142
	5	343
	6	411
<i>Aphis varians</i> Patch -----	6	375
<i>Aphis viburnicola</i> Gill. -----	3	96
	4	171
	6	411
<i>Aphodius distinctus</i> (Mull.) -----	1	7
<i>Aphrophora parallela</i> (Say) -----	5	283
<i>Aphytis mytilaspidis</i> (LeB.) -----	5	293
<i>Araecerus fasciculatus</i> (Deg.) -----	9	549
<i>Argas miniatus</i> Koch -----	2	56
	3	98
	8	523
<i>Argyresthia cupressella</i> Wlsm. -----	7	465
<i>Argyresthia</i> sp. -----	5	328-329
<i>Argyresthia thuiella</i> (Pack.) -----	3	92
	4	168
	5	338
	6	408
<i>Argyrotoxa semipurpurana</i> Kearf. -----	5	333
<i>Aristotelia fragariae</i> Busck -----	7	455
<i>Arphia conspersa</i> Scudd. -----	4 (Sup.)	211
<i>Arphia pseudonietana</i> (Thos.) -----	4 (Sup.)	196, 208, 215, 216, 218
		224, 228, 232, 235, 251
		259, 264, 265, 267
<i>Arphia simplex</i> Scudd. -----	4 (Sup.)	208, 211, 221, 243, 255
<i>Arphia sulphurea</i> (F.) -----	4 (Sup.)	205, 208, 218, 221, 264
<i>Arphia xanthoptera</i> (Burm.) -----	4 (Sup.)	205, 221, 228, 255
<i>Aspidiotus ancylus</i> (Putn.) -----	5	325
	7	442, 472
<i>Aspidiotus forbesi</i> Johns. -----	3	77
<i>Aspidiotus hederæ</i> (Vallot) -----	1	20
	3	95
<i>Aspidiotus howardi</i> Ckll. -----	5	342
<i>Aspidiotus juglans-regiæ</i> Comst. -----	4	169
	8	518
<i>Aspidiotus perniciosus</i> Comst. -----	1	6, 8-9
	3	61, 71
	4	132
	5	292
	6	368
	7	437
	9	556
<i>Aspidiotus spinosus</i> Comst. -----	9	560
<i>Asterolecanium</i> sp. -----	5	345
<i>Ataxia crypta</i> (Say) -----	2	41
<i>Atta texana</i> Buckley -----	8	517



<i>Attagenus piceus</i> (Oliv.) -----	1	23
	2	59
	6	417
	7	480
	8	525
<i>Aulocara ellioti</i> Thos. -----	4	115
	4 (Sup.)	189, 196, 199, 208, 211
		213, 223-226, 228-232
		235, 239-243, 248-255
		259-261, 266-270
<i>Aulocara</i> sp. -----	4 (Sup.)	232, 233
<i>Aulacaspis pentagona</i> (Targ.) -----	2	41
	3	77
	4	138
	6	408
	7	472
	9	580
<i>Autographa brassicae</i> (Riley) -----	1	6, 12
	2	45
	7	450
	8	501
	9	565
<i>Autoserica castanea</i> (Arrow) -----	3	64
	4	119
	5	279
	6	358
	7	419, 426
	8	487
<i>Autographa</i> sp. -----	9	565
<i>Baeus californicus</i> Pierce -----	10	648
<i>Bagous americanus</i> Lec. -----	5	343
<i>Baliosus ruber</i> (Weber) -----	6	402
<i>Basilarchia archippus</i> (Cram.) -----	5	325
<i>Bassus agilis</i> Cresson -----	8 (Sup.)	530, 534
<i>Bathyplectes curculionis</i> (Thoms.) -----	1	8
	3	67
	4	129
	6	365-366
<i>Bembex</i> sp. -----	7	478
<i>Bembecia marginata</i> (Harr.) -----	3	78
	4	140
	8	496
<i>Bigonichaeta setipennis</i> Fall. -----	4	116
<i>Blapstinus</i> spp. -----	5	322
<i>Blatta orientalis</i> L. -----	3	101
<i>Blattella germanica</i> (L.) -----	7	480
<i>Blissus hirtus</i> Montd. -----	5	338
	6	407-408
	7	471
	8	517
<i>Blissus insularis</i> Barber -----	7	471

Blissus leucopterus (Say) -----	1	6, 8
	3	66
	4	112, 123-124
	5	271-272, 284-286
	6	351, 360-362
	7	431-432
	8	485, 489-490
	9	545, 552-553
	10	628
Boopeton maculatum Caud. -----	4 (Sup.)	211, 243, 255, 257
Boopeton nubilum Say -----	4 (Sup.)	196, 199, 211, 224, 228
		235, 243, 251
Boopeton sp. -----	4 (Sup.)	228
Bovicola bovis (L.) -----	2	55
Brachymyrmex sp. -----	6	408
Brachyrhinus ligustici (L.) -----	4	129
Brachyrhinus ovatus (L.) -----	4	152
	5	314, 315
	6	390
Brachyrhinus rugosostriatus Goeze -----	4	152
	5	315
	6	390
Brachyrhinus spp. -----	5	314-315
	6	374, 390
Brachyrhinus sulcatus (F.) -----	3	85
	4	152
	5	315
Brachystola magna (Girard) -----	4 (Sup.)	189, 196, 211
		235, 243, 255, 257
Brevicoryne brassicae (L.) -----	2	46
	7	451
Bruchobius mayri (Masi) -----	2	59
Bruchophagus gibbus (Beh.) -----	7	435
Bruchus brachialis Fahraeus -----	2	59
	4	130
	6	352, 367-368
	7	420, 435
	10	630
Bruchus pisorum (L.) -----	1	23
	3	61, 83
	4	113, 147-148
	5	310
	6	386
	7	449
	9	565
Bruchus brunnea Thos. -----	4 (Sup.)	224, 239, 267
Bruchus praetiosa Koch -----	1	10
	2	54
Bruchus canadensisella Chamb. -----	9	573
Bruchus thurberiella Busck -----	6	395
Bruchus uprestidae -----	3	90
Bruchus uprestis aurulenta L. -----	4	177

Byturus unicolor Say -----	3	78
	4	139-140
	5	301
	6	352, 374
Cacoecia argyrospila (Walk.)-----	3	73
	4	113, 135
	5	294-295
Cacoecia cerasivorana (Fitch) -----	7	442
Cacoecia fervidana Clem. -----	7	468
Cacoecia fumiferana (Clem.) -----	4	163
	6	406
	7	422, 469
	9	578
	10	645
Cacoecia infumatana Zell. -----	4	113, 141
Cacoecia obsoletana Walk. -----	5	315
Caenurgia crassiuscula Haw. -----	1	7
Calaphis betulae Buckton -----	9	573
Calaphis betulaecolens (Fitch) -----	5	327
Calaphis castaneae (Fitch) -----	7	465
Calendra maidis (Chittn.) -----	4	127
Calendra spp. -----	4	127
Calendra tarda (Fall.) -----	7	471
Caliroa aethiops (F.) -----	3	95
	4	170
	5	342
	6	410
Caliroa cerasi (L.) -----	5	300
	6	373
Callarctia phyllira (Drury) -----	4	121
Calligrapha rhoda Knab -----	5	339
Calligrapha sigmoidea Lec. -----	4	169
Callirhytis flavohirta Beutm. -----	2	50
Callosamia promethea (Drury) -----	8	514
Callosobruchus maculatus (F.) -----	9	587
Callyntrotus schlectendali Nal. -----	9	583
Calocalpe undulata L. -----	7	462
Calomycterus setarius Roelofs -----	4	119
	6	358
	7	419, 427
	8	487
Calpodes ethlius (Cram.) -----	7	473
	9	581
Camnula pellucida (Scudd.) -----	4	114, 115
	4 (Sup.)	189, 196, 200-203
		214-226, 231-233
		235, 238-241, 247-251
		259-270
	5	277
	7	423, 424
Camponotus caryae (Fitch) -----	2	57



<i>Camponotus caryae rasilis</i> Wheeler -----	4	176
<i>Camponotus fallax</i> Nyl. -----	3	101
<i>Camponotus herculeanus</i> L. -----	4	176
<i>Camponotus herculeanus pennsylvanicus</i> (Deg.)--	7	422, 479
<i>Campylacantha olivacea olivacea</i> (Scudd.)----	4 (Sup.)	205, 206, 228, 243, 255
<i>Campylacantha olivacea vivax</i> -----	4 (Sup.)	235
<i>Capitophorus fragaefolii</i> (Ckll.) -----	4	153
<i>Capitophorus gillettei</i> Theob. -----	7	472
<i>Capitophorus ribis</i> (L.) -----	6	374
<i>Carpocapsa pomonella</i> (L.) -----	1	6, 9
	3	61, 71-72
	4	113, 132-133
	5	272, 293-294
	6	352, 369-370
	7	420, 422, 438-439
	8	485, 492-493
	9	556
	10	632-633
<i>Carpophilus dimidiatus</i> (F.) -----	8	525
<i>Carpophilus hemipterus</i> (L.) -----	9	587
<i>Caulacampus acericaulis</i> MacG. -----		
See <i>Priophorus acericaulis</i> . -----		
<i>Cecidomyia balsamicola</i> Lint. -----	8	512
<i>Cecidomyia cotalpae</i> (Comst.) -----	6	400
<i>Cecidomyia verrucicola</i> O.S. -----	5	332
	6	402
	7	466
<i>Cecidomyia viticola</i> O.S. -----	8	496
<i>Celama sorghiella</i> (Riley) -----	5	287
<i>Centeter cinerea</i> Ald. -----	1 (Sup.)	26
<i>Centrinaspis penicellus</i> Hbst. -----		
See <i>Geraeus penicellus</i> (Hbst.). -----		
<i>Cephalanomia gallicola</i> Ashm. -----	1	23
<i>Cephenomyia</i> sp. -----	2	56
<i>Cephus cinctus</i> Nort. -----	7	421
<i>Cephus pygmaeus</i> (L.) -----	7	421, 431
<i>Ceratonia catalpae</i> (Bdv.) -----	5	328
	6	400
	7	464
	8	510
	9	574
<i>Ceratophyllus gallinae</i> Schr. -----	4	175
<i>Cercopidae</i> -----	4	121-122, 142
	5	283
	6	391
<i>Ceresa bubalus</i> (F.) -----	7	439
<i>Ceromasia schenophori</i> Vill. -----	10	648
<i>Ceratomyia trifurcata</i> (Forst.) -----	3	82
	4	113, 147
	5	309
	6	385
	7	420, 449
	8	500

Ceuthophilus pallidus Thos. -----	5	349
Ceuthophilus spp. -----	7	481
Ceutorhynchus assimilis Payk. -----	6	352, 387
	7	450
Ceutorhynchus rapae Gyll. -----	5	310-311
Chaetocnema denticulata (Ill.) -----	5	339
Chaetocnema pulicaria Melsh. -----	4	127
	7	434
Chaitophorus viminalis Monell -----	5	337
	6	407
	7	470
Chalcodermus aeneus Boh. -----	3	70
	6	367, 390
	7	435
Chalcodermus collaris Horn -----	3	87
Chalepus dorsalis Thunb. -----	5	295
	6	402-403
	7	421, 467
	8	485, 512
Chalepus rubra Weber -----		
<u>See</u> Baliosus ruber (Weber).		
Chaoborus lacustris Freeborn -----	8	520
Chaoborus sp. -----	6	413
Chelonus annulipes Wesm. -----	8 (Sup.)	529, 530, 533, 534
Chelonus texanus Cress. -----	9	550
Chermes cooleyi Gill. -----		
<u>See</u> Adelges cooleyi Gill.		
Chermes sp. -----	5	332
Chermes strobilobius Kltb. -----	5	331-332
Chilo plejadellus Zinck. -----	8	492
Chilocorus stigma Say -----	2	43
Chionaspis americana Johns. -----	3	90
	8	511
Chionaspis euonymi Comst. -----	2	52
	3	93
	4	167
	6	409
	7	473
	8	517-518
	9	581
Chionaspis furfura (Fitch) -----	6	369
Chionaspis ortholobis Comst. -----	1	18
	9	579
Chionaspis pinifoliae (Fitch) -----	1	17
	2	50
	3	91
	4	166
	5	335
	6	405
	9	577

<i>Chloealtis conspersa</i> Harr. -----	4 (Sup.)	205, 215, 218, 239, 267
<i>Chlorochroa sayi</i> (Stal) -----	4	117
	7	421, 429
	9	551
<i>Chlorophorus annularis</i> (F.) -----	3	102
<i>Chorizagrotis auxiliaris</i> (Grote) -----	5	282
<i>Chortippus curtipennis</i> (Harr.) -----	4 (Sup.)	259
<i>Chortippus longicornis</i> (Latr.) -----	4 (Sup.)	196, 202, 203, 205
		208, 215, 218, 224, 232
		239, 251, 264, 265, 267
<i>Chortophaga viridifasciata</i> (Deg.) -----	4 (Sup.)	193-194, 205, 206, 211
		222, 243, 254, 255, 257
	5	276
<i>Chrysobothris femorata</i> (Oliv.) -----	1	16
	3	70
	4	131
	9	556
<i>Chrysoclista linneella</i> Clerck -----	4	164
<i>Chrysomela interrupta</i> (F.)		
<u>See</u> <i>Chrysomela lapponica</i> (L.) -----	5	336-337
	8	515
<i>Chrysomela scripta</i> F. -----	5	337
	6	406
	7	470
	8	515
<i>Chrysomphalus aonidum</i> (L.) -----	5	341
	9	560, 579
<i>Chrysomphalus citrinus</i> (Coq.)	5	303
	9	560
<i>Chrysomphalus obscurus</i> (Const.) -----	1	10
	2	42, 50
	7	468
	9	576
<i>Chrysops discalis</i> Will. -----	5	346
	6	415
<i>Chrysops fuliginosa</i> Wied. -----	4	172
<i>Chrysops fulvastra</i> O.S. -----	5	346
	6	415
<i>Chrysops nigra</i> Macq. -----	5	346
<i>Chrysops</i> sp. -----	5	346
	6	415
<i>Cicadellidae</i> -----	4	141
	7	439-440
	8	493
	9	557, 560
<i>Cimbex americana</i> Leach -----	8	515
<i>Cimex lectularius</i> L. -----	1	21
	3	96
<i>Cinara sabinæ</i> Gill. -----	5	341
<i>Cincticornia pilulæ</i> Walsh -----	6	404
<i>Cingilia catenaria</i> (Drury) -----	8	509



<i>Cirphis unipuncta</i> (Haw.) -----	4	112,124-125
	5	272,286-287
	6	360
	8	487
	9	550
<i>Cladius isomerus</i> Nort. -----	4	170
<i>Clytroleptus albofasciatus</i> (Lap.) -----	7	420,442
<i>Cnephasia longana</i> (Haw.) -----	4	153
	5	314
	7	420,445
<i>Coccus hesperidum</i> L. -----	4	167
	6	408
	7	472
	8	517
	9	580
<i>Cochliomyia americana</i> C. & P. -----	2	55
	3	97-98
	4	173-174
	5	345
	6	415
	7	421,477-478
	8	521-522
	9	585
	10	646-647
<i>Cochliomyia macellaria</i> (F.) -----	7	478
	8	521
<i>Cochliomyia</i> sp. -----	3	98
<i>Colaspis brunnea</i> (F.) -----	4	168
	5	272,290
	6	365,376
<i>Colaspis</i> sp. -----	5	340
<i>Coleophora laricella</i> Hbn. -----	4	163-164
	5	331
<i>Coleophora malivorella</i> Riley -----	3	73
	4	135
	5	295
	6	370
<i>Colias eurytheme</i> Bdv. -----	3	70
	7	434
	8	491
<i>Colopha ulmicola</i> (Fitch) -----	6	401
<i>Coloradia pandora</i> Blake -----	4	165-166
	5	334
	10	645
<i>Conopia bibionipennis</i> (Bdv.) -----	6	391
<i>Conopia exitiosa</i> (Say) -----	1	9
	2	40
	3	76,100
	4	137
	5	298-299
	7	441
	8	495
	9	558

<i>Conopia pictipes</i> (G. & R.) -----	3	76
<i>Conopia rhododendri</i> (Beutn.) -----	3	95
<i>Conotrachelus anaglypticus</i> (Say) -----	6	409
<i>Conotrachelus erinaceus</i> Lec. -----	5	320
<i>Conotrachelus nenuphar</i> (Hbst.) -----	3	76-77
	4	113, 138
	5	272, 297-298
	6	352, 372-373
	7	440
	8	485, 494
	9	558
<i>Conozoa</i> sp. -----	4 (Sup.)	202, 232, 248, 249
<i>Conozoa sulcifrons</i> Scudd. -----	4 (Sup.)	232, 233, 259
<i>Contarinia sorghicola</i> (Coq.) -----	7	436
<i>Contarinia</i> sp. -----	4	169
<i>Contarinia virginianiae</i> Felt -----	5	328
<i>Cordillacris crenulata</i> Brun. -----	4 (Sup.)	196, 210, 211, 224, 227
		228, 235, 251, 267
<i>Cordillacris occipitalis</i> Thos. -----	4 (Sup.)	196, 235, 239
<i>Cordillacris occipitalis occipitalis</i> Thos. -	4 (Sup.)	224, 228, 251, 267
<i>Corizus sidae</i> (F.) -----	8	516
<i>Corthylus punctatissimus</i> (Zimm.) -----	3	95
<i>Corythucha arcuata</i> (Say) -----	6	410
	7	468
<i>Corythucha ciliata</i> (Say) -----	9	576
<i>Corythucha cydoniae</i> Fitch -----	9	581
<i>Corythucha marmorata</i> (Uhl.) -----	3	93
	5	339
<i>Cossula magnifica</i> Stkr. -----	1	10
	2	42
<i>Cotinis nitida</i> (L.) -----	3	91
	6	357
	7	425
	9	548
<i>Crambus caliginosellus</i> Clem. -----	4	154
	5	316
<i>Crambus</i> sp. -----	4	127
	5	283
<i>Crambus trisectus</i> Walk. -----	5	338
<i>Cratypedes neglectus</i> Thos. -----	4 (Sup.)	196, 224, 235, 267
<i>Cremastus flavoorbitalis</i> (Cam.) -----	8 (Sup.)	530, 533
<i>Crematogaster lineolata</i> (Say) -----	3	101
	4	176
	5	348
	9	536
<i>Crematogaster lineolata</i> var. near <i>cerasi</i> Fitch -----	6	375-376
<i>Creontiades femoralis</i> Van D. -----	9	570
<i>Crioceris asparagi</i> (L.) -----	2	46
	3	84
	4	150-151
	5	272, 313

<i>Crioceris asparagi</i> (L.) (Cont'd.) -----	6	388
	7	453
	9	566
	10	637
<i>Crioceris duodecimpunctata</i> (L.) -----	5	313
	7	453
	10	637
<i>Crioceris</i> spp. -----	5	313
	10	637
<i>Cryptococcus fagi</i> (Baer.) -----	9	572
<i>Cryptophyllaspis liquidambaris</i> Kot. -----	6	412
<i>Ctenocephalides canis</i> (Curt.) -----	1	21
	3	96
<i>Ctenocephalides felis</i> (Bouche) -----	3	96
<i>Culex bahamensis</i> D. & K. -----	2	54
<i>Culex pipiens</i> L. -----	7	476
	8	520
	9	584
<i>Culex tarsalis</i> Coq. -----	3	97
	7	476
	8	520
<i>Culicinae</i> -----	2	54
	3	97
	4	172
	6	413
	7	476
	8	519
	9	584
<i>Culicoides</i> spp. -----	2	54
	4	172
	8	520
<i>Culicoides melleus</i> (Coq.) -----	8	520
<i>Curculio algonquinus</i> (Csy.) -----	9	559
<i>Curculio caryae</i> (Horn) -----	1	10
	7	443
	9	559-560
<i>Curculio proboscideus</i> F. -----	9	559
<i>Curculio rectus</i> (Say) -----	9	559
<i>Curculio</i> spp. -----	9	559-560
<i>Curculionidae</i> -----	3	73
<i>Cylas fornicarius</i> (F.) -----	1	14
	8	503
	9	567
<i>Cylindrocopturus longulus</i> (Lec.) -----	6	402
<i>Cyllene robiniae</i> (Forst.) -----	1	17
	4	164
	6	403
	8	512
	9	575
<i>Cynaesus angustus</i> (Lec.) -----	7	481



<i>Dactylopius confusus newsteadi</i> O'kell. -----	6		418
<i>Dactyloctenium pictum</i> Thos. -----	4 (Sup.)	196, 223, 235, 251,	255
<i>Danaus manippe</i> (Hbn.) -----	9		551
<i>Dasyneura leguminicola</i> (Lint.) -----	6		367
<i>Dasyneura mali</i> Kieff. -----	5		296
<i>Dasyneura pyri</i> (Bouche) -----	5		300
<i>Dasyneura rhodophaga</i> (Coq.) -----	3		96
	10		640-641
<i>Datana integerrima</i> G. & R. -----	6		376-377
	7		444
	8		515
<i>Datana major</i> G. & R. -----	9		580
<i>Datana ministra</i> (Drury) -----	6		370
	7		437
	8		493
<i>Deinocerites cancer</i> Theob. -----	6		413
<i>Dendroctonus brevicornis</i> Lec. -----	10		644
<i>Dendroctonus frontalis</i> Zimm. -----	7		468
	8		513-514
<i>Dendroctonus monticolae</i> Hopk. -----	10		643
<i>Dendroctonus pseudotsugae</i> Hopk. -----	6	353, 401-	402
	10		643-644
<i>Dendroctonus terebans</i> (Oliv.) -----	7		468
	8		514
<i>Deprus</i> sp. -----	4 (Sup.)		235
<i>Dermacentor andersoni</i> Stiles -----	3		97
	4		173
	5		345
	7		477
	10		647
<i>Dermacentor occidentalis</i> Neum. -----	8		521
	9		584
<i>Dermacentor variabilis</i> (Say) -----	1		21
	3		97
	4		172-173
	5		344, 345
	6	353, 413-	414
	7		476-477
	8		521
	10		647
<i>Dermanyssus gallinae</i> (Deg.) -----	5		347
<i>Dermestidae</i> -----	7		480
	8		525
<i>Derocrepis erythropus</i> (Melsh.) -----	4		131
<i>Derotmema haydenii</i> Thos. -----	4 (Sup.)	196, 211, 224,	228
		235, 239, 251, 259,	267
<i>Derotmema laticinctum</i> Scudd. -----	4 (Sup.)		235
<i>Derotmema</i> sp. -----	4 (Sup.)		235
<i>Desmia funeralis</i> (Hbn.) -----	3		78
	4		140
	6		375
	7		443

Dexia ventralis Ald. -----	1 (Sup.)	25
Diabrotica balteata Lec. -----	2	43
	3	82
	4	143
	5	312
	7	444-445
	9	546, 562
Diabrotica duodecimpunctata (F.) -----	1	11
	2	40, 43-44
	3	67, 80
	4	127, 143
	5	312
	7	444
	8	498
	9	562
Diabrotica duodecimpunctata tenella Lec. ---	7	445
Diabrotica longicornis (Say) -----	7	433-434
Diabrotica soror Lec. -----	7	445
Diabrotica spp. -----	5	311-312
	7	444-445
	8	498
	9	562
Diabrotica tricineta (Say) -----	8	498
Diabrotica trivittata (Mann.) -----	8	498
Diabrotica vittata (F.) -----	3	80
	4	150
	5	272, 311, 312
	6	378
	7	444
	8	498
	9	562
Dialeurodes citri (Ashm.) -----	2	42
	3	93
	4	142
	5	303
	7	471
	8	497, 516
	9	579
Dialeurodes spp. -----	8	516
Diaphania hyalinata (L.) -----	7	452
	8	502
Diaphania nitidalis (Stoll) -----	5	312
	6	388
	7	452
	8	502
Diaphania spp. -----	7	452
	8	502
	9	565-566
Diapheromera femorata (Say) -----	9	572
Diarthronomyia hypogaea (Loew) -----	1	19
Diaspis carueli Targ. -----	2	52
	5	341
	6	409
	7	474

<i>Diatraea crambidoides</i> (Grote) -----	6	363
<i>Diatraea saccharalis</i> (F.) -----	8	491, 492
<i>Dibolia borealis</i> Chevr. -----	2	59
<i>Dichomeris marginellus</i> F. -----	3	94
	5	341
	7	474
<i>Dichromina</i> sp. -----	5	338
<i>Dichromorpha viridis</i> (Scudd.) -----	4 (Sup.)	205, 206, 208, 221
<i>Dikraneura cockerellii</i> Gill. -----	4	141
<i>Dilachnus</i> sp. -----	9	577
<i>Dinocampus coccinellae</i> (Schr.) -----	7	433
<i>Dinoderus brevis</i> (Horn) -----	7	481
<i>Diplotaxis frondicola</i> Say -----	3	96
<i>Diprion polytomum</i> (Htg.) -----	5	335-336
	6	406
	7	422
	9	546, 577-578
<i>Diprion simile</i> (Htg.) -----	7	469
<i>Diptera</i> -----	2	47
	5	344
	9	567
<i>Disonycha triangularis</i> (Say) -----	6	407
<i>Dissosteira carolina</i> (L.) -----	4 (Sup.)	139, 193-194, 196
		202-203, 205, 208-211
		215-218, 221, 224-226
		228, 232, 235, 239, 243
		248-249, 251, 255, 259
		261, 264, 267, 269
<i>Dissosteira longipennis</i> (Thos.) -----	3	62
	4	115
	4 (Sup.)	179, 188-189
		195, 196, 200, 211
		228, 234, 235, 237, 242
		243, 254, 255, 257, 267
	5	275-277
	6	352, 354
	7	423, 424
	10	628
<i>Dissosteira spurcata</i> Sauss. -----	4 (Sup.)	189, 202, 259
<i>Doryphorophaga doryphorae</i> (Riley) -----	9	563
<i>Dorytomus mucidus</i> (Say) -----	2	50
<i>Drepanaphis acerifoliae</i> (Thos.) -----	5	332
	6	403
	9	575
<i>Drepanopterna femoratum</i> Scudd. -----	4 (Sup.)	196, 211, 224
		228, 235, 237, 239.
		251, 255, 259, 267
<i>Drepanothrips reuteri</i> Uzel -----	5	302
<i>Dynastes titus</i> (L.) -----	4	164
<i>Dysdercus suturellus</i> (H.S.) -----	1	15
	5	322
	8	506
	9	570



Elasmopalpus lignosellus (Zell.) -----	4	127
	5	289
Elateridae -----	3	64
	4	111, 118-119
	5	273-274, 280
	6	358-359
	7	425
	9	549
Eleodes opaca (Say) -----	3	66
Eleodes spp. -----	4	120
	9	553
Ellopia fiscellaria Guen. -----	10	645
Empoasca fabae (Harr.) -----	4	146
	5	307, 343
	6	382-383
	7	447
Empoasca sp. -----	9	564
Enchenopa binotata (Say) -----	9	551
Encoptolophus pallidus subgracilis Caud. ---	4 (Sup.)	243, 255
Encoptolophus sordidus costalis Scudd. ----	4 (Sup.)	196, 224, 228, 235
		239, 255, 257, 267
Encoptolophus sordidus sordidus (Burm.) ---	4 (Sup.)	208, 215, 218, 221, 224
		239, 264
Encoptolophus subgracilis texensis Burm. ---	4 (Sup.)	228
Engytatus geniculatus Reut. -----	2	45
	6	383
Ennomos subsignarius (Hbn.) -----	5	323
Entomoscelis adonidis (Pallas) -----	6	378
Epargyreus tityrus F.		
See Proteides clarus (Cram.).		
Ephestia cautella (Walk.) -----	2	58
Ephestia figulilella Greg. -----	7	443
Ephydra subopaca Loew -----	7	481
Epicaerus imbricatus Say -----	3	73
	5	314
Epicaerus formidolosus Boh. -----	5	320
	6	377
Epicauta cinerea (Forst.) -----	4	144
	6	379
	7	428
	8	487
Epicauta ferruginea (Say) -----	5	281
Epicauta lemniscata F. -----	5	281
	7	427, 428
Epicauta maculata (Say) -----	5	281
	6	379
Epicauta marginata (F.) -----	5	281
	6	378
	7	427
Epicauta pennsylvanica (Deg.) -----	7	427
	8	487
Epicauta sericans Lec. -----	7	428

<i>Epicauta</i> spp. -----	7	428
<i>Epicauta vittata</i> (F.) -----	6	379
	7	427
	8	487
<i>Epilachna borealis</i> (F.) -----	6	388
	7	452
<i>Epilachna varivestis</i> Muls. -----	3	61,82
	4	146-147
	5	272,308-309
	6	383-385
	7	420,448-449
	8	485,499-500
	9	546,564
	10	636
<i>Epinotia meritana</i> Heinr. -----	7	466
<i>Epinotia nanana</i> Treit. -----	5	336
<i>Epitrimerus</i> sp. -----	7	475
<i>Epitrix cucumeris</i> (Harr.) -----	4	113,143,146
	5	306,307
	6	380-381
	7	446
<i>Epitrix parvula</i> (F.) -----	2	47
	3	86
	4	154
	5	306,316
<i>Epitrix</i> spp. -----	5	272,274,306-307
	6	380-381
<i>Epitrix subcrinita</i> Lec. -----	4	146
	5	306
<i>Epochra canadensis</i> Loew -----	4	140
<i>Eretmocerus haldemani</i> How. -----	8	507
<i>Erinnyis alope</i> Drury -----	6	377
<i>Erinnyis</i> sp. -----	6	377
<i>Eriocampa juglandis</i> (Fitch) -----	8	515
<i>Eriococcus azaleae</i> Comst. -----	2	51
	3	92
	4	168
	5	339
	6	408
	9	580
<i>Eriophyes fraxiniflora</i> Felt -----	7	463
	8	509
<i>Eriophyes pyri</i> Pgst. -----	5	300
	8	495
<i>Eriosoma americanum</i> (Riley) -----	5	330
	6	401
	8	511
<i>Eriosoma crataegi</i> (Oestlund) -----	7	474
	9	582
<i>Eriosoma lanigerum</i> (Hausm.) -----	2	39
	3	75
	5	296,330
	6	371,401

<i>Eriosoma lanigerum</i> (Cont'd.) -----	8	493
	9	557
<i>Eriosoma</i> spp. -----	6	401
<i>Erythraspides pygmaea</i> (Say) -----	7	443
<i>Erythroneura comes</i> (Say) -----	3	79
	4	141
	5	301-302
	6	375
	7	443
	8	496
	9	559
<i>Erythroneura comes ziczac</i> Walsh -----	5	302
	6	375
	8	496
<i>Erythroneura dowelli</i> Beam. -----	7	440
<i>Erythroneura elegans</i> McA. -----	5	302
<i>Erythroneura hartii</i> (Gill.) -----	8	493
	9	557
<i>Erythroneura lawsoniana</i> Baker -----	7	440
	9	557
<i>Erythroneura obliqua</i> (Say) -----	9	557
<i>Erythroneura omani</i> Beam. -----	7	440
<i>Erythroneura</i> spp. -----	6	375
	7	443
	8	496
<i>Erythroneura tricineta cymbium</i> McA. -----	4	141
<i>Euceraphis betulae</i> (Koch) -----	5	327
<i>Eucosma gloriola</i> Heinr. -----	7	469
<i>Euetheola rugiceps</i> (Lec.) -----	4	130
	5	289
<i>Eulophus viridulus</i> Thoms. -----	8 (Sup.)	529, 533-534
<i>Eupalopsis mali</i> Ewing -----	7	442
	9	558
<i>Eupelmus allnyi</i> (French) -----	2	59
<i>Euphoria fulgida</i> (F.) -----	6	371
<i>Euphoria inda</i> (L.) -----	6	358
	9	548
<i>Euphoria rufobrunnea</i> Csy. -----	9	549
<i>Euphoria sepulchralis</i> (F.) -----	4	131
<i>Euphoria</i> spp. -----	9	548-549
<i>Euryopthalmus convivus</i> Stal -----	3	92
	8	502
<i>Eutettix tenellus</i> (Bak.) -----	1	14
	3	86
	4	113, 153-154
	6	383
	8	504
	9	566
	10	634-635
<i>Eutrombicula alfreddugesi</i> (Oud.) -----	6	414
<i>Eutrombidium trigonum</i> (Hermann) -----	6	355
<i>Euxoa ochrogaster</i> (Guen.) -----	5	273
<i>Euxoa</i> sp. -----	5	282



<i>Feltia venerabilis</i> Walk. -----	4	121
<i>Fenusa pumila</i> Klug -----	5	327
	6	399
<i>Fenusa ulmi</i> Sund. -----	5	330
<i>Fidia viticida</i> Walsh -----	3	79
	5	302
	6	375
<i>Fiorinia theae</i> Green -----	9	580
<i>Forficula auricularia</i> L. -----	1	7
	3	65
	4	116-117
	6	351, 356
	7	419, 425
<i>Formica fusca</i> L. -----	5	348
<i>Formica truncicola integra</i> Nyl. -----	8	524
<i>Formicidae</i>	2	57
	4	176
	5	347
	6	416-417
	7	479-480
	8	524
	9	586
<i>Frankliniella cephalica</i> (Crawf.) -----	3	95
	4	167
<i>Frankliniella fusca</i> (Hinds) -----	4	157
	5	316
	6	379
	8	498
<i>Frankliniella moultoni</i> Hood -----	3	81
	8	516
	9	564, 582
<i>Frankliniella</i> spp. -----	8	498, 516
<i>Frankliniella tritici</i> (Fitch) -----	1	10
	3	92
	4	132
	6	373
	8	498, 516
	9	580
<i>Galerucella xanthomelaena</i> (Schr.) -----	1	16
	4	162
	5	329
	6	400-401
	7	421, 465-466
	8	485, 510
<i>Gargaphia solani</i> Heid. -----	6	389
<i>Gasterophilus haemorrhoidalis</i> (L.) -----	4	175
	5	346
	6	416
<i>Gasterophilus intestinalis</i> (Deg.) -----	8	523
<i>Gasterophilus nasalis</i> (L.) -----	4	175
	8	523

Gasterophilus spp. -----	4	175
	8	523
Geometridae -----	2	49
	3	61,88-89
	4	113,158-159
	5	323
Geraeus penicellus (Hbst.) -----	7	434
Glyptoscelis squamulata Crotch -----	3	79
Gnathocerus cornutus (F.) -----	4	177
Gnorimoschema lycopersicella (Busck)		
<u>See</u> Keiferia lycopersicella (Busck).		
Gnorimoschema operculella (Zell.) -----	5	273,316
	6	352,381
	8	499
	9	546,563
Gossyparia spuria (Mod.) -----	1	17
	4	162
	5	330-331
	6	401
	7	466
	8	511
	9	574
Gracilaria azaleella Brants -----	1	19
	9	580
Gracilaria sp. -----	5	328
Grapholitha molesta (Busck)-----	2	40
	3	76
	4	137
	5	274,298
	6	371-372
	7	420,441
	8	494-495
	9	557-558
	10	633
Grapholitha packardi Zell. -----	5	300
Grapholitha prunivora (Walsh) -----	9	558
Graphops pubescens (Melsh.) -----	5	315
	6	390
Gryllidae -----	2	44
	3	88
	8	524-525
Gryllotalpa hexadactyla Perty -----	3	81
	7	448
Gryllus assimilis F. -----	1	14,23
	3	101
	4	144
	6	391,417
	8	525
	9	586
Gryllus domesticus L. -----	7	480
Gryllus sp. -----	8	524
Gynaikothrips uzeli (Zimm.)-----	4	167

Hadrotettix speciosus Scudd. -----	4 (Sup.)	196, 251
Hadrotettix trifasciatus Say -----	4 (Sup.)	196, 211, 221
		224, 228, 235, 239
		243, 251, 255, 267
Haemaphysalis leporis-palustris Pack. -----	3	99
Haematobia irritans L. -----	2	55
	4	174
	5	345
	6	415
	7	478
	8	522
	9	585
Haematopinus adventicius Neum. -----	9	586
Haematopinus asini (L.) -----	2	56
Haematopinus eurysternus Nitz. -----	3	98
	6	415
	8	522
Haematopinus suis (L.)		
See Haematopinus adventicius Neum.		
Halisidota caryae (Harr.) -----	7	462
Halisidote harrisi Walsh -----	7	470
Halticinae -----	2	44
	3	81
	4	143-144
	5	304
	6	407
Halticus bracteatus (Say) -----	9	583
Halticus citri (Ashm.) -----	3	86
	5	291
	8	500
Hamadryas antiopa (L.) -----	4	161-162
	7	462
	8	516
Harmolita grandis (Riley) -----	5	286
Harmolita tritici (Fitch) -----	5	286
	7	419, 430
	8	485, 489
Harmolita vaginicola (Doane) -----	8	489
Harrisina americana (Guer.) -----	6	375
Heliothis armigera (Hbn.) -----	1	19
	3	85, 87
	4	112, 126
	5	272, 283-289
		307, 320
	6	351, 352, 362-363
		381, 394-395
	7	420, 454-455
		457-458
	8	485, 499, 505
	9	545, 553, 561
	10	638-639
Heliothis obsoleta (F.)		
See Heliothis armigera (Hbn.).		



<i>Heliothis virescens</i> (F.) -----	4	154
	6	395
<i>Hellula undalis</i> (F.) -----	2	46
	4	149
	9	566
<i>Hemerocampa definita</i> Pack. -----	7	471
<i>Hemerocampa pseudotsugata</i> McD. -----	10	645
<i>Hercothrips fasciatus</i> Perg. -----	6	385
<i>Hercinothrips femoralis</i> (Reut.) -----	5	305
<i>Hesperotettix speciosus</i> (Scudd.) -----	4 (Sup.)	196, 199, 208, 211 213, 221, 228, 230 243, 251, 253, 255, 257
		196, 205, 208
<i>Hesperotettix viridis</i> Thos. -----	4 (Sup.)	211, 215, 218, 221 224, 228, 235, 239, 243 251, 255, 259, 261, 264 267
<i>Hippelates</i> spp. -----	5	344
	6	413
	7	476
	8	520
<i>Hippiscus rugosus</i> (Scudd.) -----	4 (Sup.)	193-194, 196, 205 206, 208, 211, 221 228, 243, 251, 256
<i>Hippodamia convergens</i> Guer. -----	4	150
<i>Homalopalia dalera</i> Dyar -----	6	377
<i>Horistonotus uhleri</i> Horn -----	6	358
	7	425
<i>Horistonotus</i> sp. -----	7	425
<i>Hyalopterus arundinis</i> (F.) -----	4	139
<i>Hylastinus obscurus</i> (Marsham) -----	4	130
	6	367
<i>Hylemya antiqua</i> (Meig.) -----	4	152
	5	314
	6	389
<i>Hylemya brassicae</i> (Bouche) -----	4	149
	5	274, 310
	6	389
<i>Hylemya cilicrura</i> (Rond.) -----	1	6, 14
	2	44
	5	304-305
<i>Hylemya</i> sp. -----	1	11
<i>Hylobius radialis</i> Buch. -----	4	165
	6	405
	9	577
<i>Hylotrupes bajulus</i> L. -----	2	59
<i>Hylurgopinus rufipes</i> (Eich.) -----	4	162
	5	329
<i>Hymenia fascialis</i> (Cram.) -----	8	503
	9	546, 566
<i>Hypera brunneipennis</i> (Boh.) -----	3	61, 67

<i>Hypera postica</i> (Gyll.) -----	1	8
	3	61,67
	4	129
	5	291
	6	365-366
	7	434
	8	491
	8 (Sup.)	539-543
	9	554
	10	629
<i>Hypera punctata</i> (F.) -----	3	68
	4	129
<i>Hypera</i> sp. -----	1	7
<i>Hypermallus villosus</i> (F.) -----	7	439
	8	507
	9	576
<i>Hyphantria cunea</i> (Drury) -----	4	160
	5	325
	6	353,397
	7	421,461-462
	8	485,508
	9	546,571
<i>Hyphantria textor</i> Harr. -----	5	325
	8	508
<i>Hyphantria</i> spp. -----	8	507-508
<i>Hypochlora alba</i> Dodge -----	4 (Sup.)	196,205,211,228
		239,243,251,267
<i>Hypoderma bovis</i> (Deg.) -----	4	174
	5	345
<i>Hypoderma lineatum</i> (DeVill.) -----	2	55
<i>Hypoderma</i> spp. -----	2	55
	3	98
	6	415
<i>Hypsopygia costalis</i> (F.) -----	7	435
<i>Hysteroneura setariae</i> (Thos.) -----	4	139
	6	374
<i>Icerya purchasi</i> Mask. -----	2	42
	3	79,92
	4	142
	5	303
	6	408
	7	472
	8	514
<i>Ichthyura inclusa</i> Hbn. -----	8	514
<i>Inareolata punctoria</i> Roman -----	8 (Sup.)	530,532,534
<i>Ips avulsus</i> (Eich.) -----	2	50
<i>Ips calligraphus</i> (Germ.) -----	2	50
	7	468
<i>Ips grandicollis</i> (Eich.) -----	8	514
<i>Ips oregoni</i> (Eich.) -----	10	644
<i>Ips ponderosae</i> Sw. -----	10	644

<i>Iridomyrmex humilis</i> Mayr -----	2	57
	3	100
	4	176
	5	347
	6	417
	7	479
	8	524
	9	586
<i>Isoptera</i> -----	2	56-57
	3	99-100
	4	177
	7	479
	9	555
<i>Ithycerus noveboracensis</i> (Forst.) -----	5	295
<i>Ixodes ricinus scapularis</i> Say -----	3	99
<i>Keiferia lycopersicella</i> (Busck) -----	1	11
	3	81-82
	4	144-145
	6	382
	7	447
	9	563
	10	636
<i>Kermes pubescens</i> Bogue -----	5	333
<i>Labopidea allii</i> Knight -----	4	151
<i>Labops hirtus</i> Knight -----	4	124
<i>Labrorychus prismaticus</i> Nort. -----	8 (Sup.)	529, 530, 534
<i>Lachnus sabinæ</i> Gill. -----	3	94
<i>Lachnus</i> sp. -----	3	91
<i>Lachnus thujafilina</i> (Del G.) -----	1	18
	2	51
<i>Languria</i> sp. -----	9	549
<i>Lapara bombycoides</i> Walk. -----	7	469
<i>Laphygma exempta</i> Walk. -----	10	648
<i>Laphygma exigua</i> (Hbn.) -----	5	322
<i>Laphygma frugiperda</i> (A. & S.) -----	3	85
	4	125
	5	289
	6	351, 365
	7	419, 428-429
	8	485, 488
	9	545, 550, 553
<i>Lasioderma serricorne</i> (F.) -----	1	23
<i>Lasioptera clavula</i> Beutm.		
<u>See</u> <i>Mycodiplosis alternata</i> Felt.		
<i>Lasioptera querciperda</i> Felt -----	4	165
<i>Lasius interjectus</i> Mayr -----	1	22
	2	57
	4	176
	5	348



<i>Lasius niger alienus americanus</i> Emery -----	1	22
<i>Laspeyresia caryana</i> (Fitch) -----	2	41
	8	497
<i>Latrodectus mactans</i> (F.) -----	2	54
	9	585
	10	648
<i>Lecanium corni</i> Bouche -----	4	132,171
	5	325,338
<i>Lecanium fletcheri</i> Ckll. -----	6	412
	9	580
<i>Lecanium nigrofasciatum</i> Perg. -----	4	139
<i>Lema lecontei</i> Clark -----	6	418
<i>Lepidoptera</i> -----	7	422
<i>Lepidosaphes beckii</i> (Newm.) -----	1	10
<i>Lepidosaphes camelliae</i> Hoke -----	1	19
<i>Lepidosaphes ficus</i> (Sign.) -----	2	43
	3	80
<i>Lepidosaphes ulmi</i> (L.) -----	1	16
	3	71
	4	167
	5	326
	6	399
	7	463
	9	579
<i>Leprus</i> sp. -----	4 (Sup.)	255
<i>Leptinotarsa decemlineata</i> (Say) -----	2	44
	3	81
	4	145
	5	305-306
	6	380
	7	446
	9	563
<i>Leptoconops kerteszi americanus</i> Carter -----	5	347
<i>Leptocoris trivittatus</i> (Say) -----	1	21
	2	58
	3	101
	4	161
	5	328,341
	6	371
	7	464
	8	510
	9	573-574
<i>Leptoglossus phyllopus</i> (L.) -----	4	171
	5	301
	8	497
	9	560
<i>Leptoypha minor</i> McA. -----	5	327
<i>Leucaspis japonica</i> Ckll. -----	1	18
<i>Leucocnemis</i> sp. -----	3	90
<i>Ligyris gibbosus</i> (Deg.) -----	3	81
	5	304
	6	378
	8	497

Limenius agonus (Say) -----	6	358
Limenius californicus (Mann.) -----	1	7
	3	64
	4	118-119
	5	280
	6	359
	8	487
	9	549
Limenius canus Lec. -----	3	64
	4	119
	6	359
Limenius ectypus (Say) -----	4	118
Limenius infuscatus Mots. -----	3	64
Limenius sp. -----	4	118
Limenius subauratus Lec. -----	3	64
Limothrips cerealium Haliday -----	8	521
Linognathus setosus (Olfers) -----	3	99
Linognathus sp. -----	2	56
Linognathus vituli L. -----	5	345
	6	416
Liothrips vaneeckei Priesn. -----	1	20
Liponyssus bacoti (Hirst) -----	3	97
	4	173
	5	345
Listroderes obliquus Klug -----	2	43
	3	80
	4	143
	5	304
	8	497
Lithocolletis cincinnatiella Chamb. -----	5	333-334
Lithocolletis hamadryella Clem. -----	6	404
Lixus concavus Say -----	7	454
Longitarsus waterhousei Kutsch. -----	6	391
Lopidea davisi Knight -----	4	170
Loxostege similalis (Guen.) -----	7	434-435
Loxostege sticticalis (L.) -----	4	153
	5	274, 282
	6	351, 359
	7	429
	8	503
	10	635-636
Ludius aeripennis (Kby.) -----	4	118
	5	280
	9	549
Ludius sp. -----	4	118
Luperodes brunneus Crotch -----	6	365
Luperodes sp., near brunneus Crotch -----	6	410
Lycia ursaria Walk. -----	4	160
Lyctus parallelipedus (Melsh.) -----	7	481
Lyctus cavicollis Lec. -----	3	102
Lyctus planicollis Lec. -----	1	23
	3	101-102
	7	481

Lyctus spp. -----	2	58
	3	101-102
	7	481
Lydella griseus R.D. -----	8 (Sup.)	528, 530-532, 534
Lydella sp. -----	8 (Sup.)	528
Lydella stabulans griseus R.D. -----	8 (Sup.)	531, 534
Lygaeonematus erichsonii (Htg.) -----	5	331
	6	402
	7	422, 466
	9	574
Lygus elisus Van D. -----	3	70
	9	554
Lygus elisus hesperus Knight -----	3	69-70
	9	554
Lygus pratensis (L.)		
<u>See</u> Lygus pratensis oblineatus (Say).		
Lygus pratensis oblineatus (Say) -----	1	15
	2	40, 48
	3	69, 70
	5	274, 313
Lygus spp.	9	554
Lyonetia latistrigella Wlsm. -----	4	170
Lysiphlebus testaceipes (Cress.) -----	7	433
Lytta stygica (Lec.) -----	7	428
Macrobasis segmentata (Say) -----	5	281
Macrobasis unicolor (Kby.) -----	5	280-281
	6	379
	7	427, 428
Macrocentrus gifuensis Ashm. -----	8 (Sup.)	530, 533, 534
Macrocentrus robustus Mues. -----	8 (Sup.)	534
Macroductylus subspinosus (F.) -----	5	271, 274, 279-280
Macronoctua onusta Grote -----	7	474
	8	519
Macropsis trimaculata (Fitch) -----	7	437
Macrosiphoniella sanborni (Gill.) -----	2	51, 53
	3	93
Macrosiphum granarium (Kby.) -----	5	286
Macrosiphum lilii (Monell) -----	9	582
Macrosiphum pisi (Kltb.) -----	3	61, 68-69
	4	112, 128-129, 148
	5	291, 309-310
	6	352, 366, 385-386
	7	435
Macrosiphum rosae (L.) -----	1	20
	2	53
	3	96
	4	171
	5	342-343
	6	411
	7	475
	9	583



Macrosiphum rudbeckiae (Fitch) -----	7	471
Macrosiphum solanifolii (Ashm.) -----	1	11
	2	45
	4	146
	5	307
	6	382, 411
	7	445
Macrosteles divisus (Uhl.) -----	5	314
	6	352, 383
	7	454
Magdalis armicollis (Say) -----	8	511
Magdicada septendecim (L.) -----	5	326-327
	6	399
	10	641
Malacosoma americana (F.) -----	1	9
	2	38
	3	72-73, 89
	4	134
	10	633
Malacosoma californica (Pack.) -----	4	134
Malacosoma constricta (Stretch) -----	6	396
Malacosoma disstria Hbn. -----	3	72, 89
	4	159
	5	273, 324-325
	6	396
	7	422, 461
Malacosoma fragilis (Stretch) -----	4	159
	5	324
	6	353, 397
	10	645-646
Malacosoma pluvialis (Dyar) -----	3	89
	4	132, 159
	5	292, 325
	6	353, 396
Malacosoma spp. -----	3	61, 89
	4	112, 132, 159-160
	6	396
Mansonina perturbans (Walk.) -----	9	584
Marmara sp. -----	3	91
Matsucoccus sp. -----	1	17
Melanocallis caryaefoliae (Davis) -----	3	79
	7	444
	8	497
	9	560
Melanophila fulvoguttata Harr. -----	4	163
Melanophila fulvoguttata drummondi Kby. -----	4	160
Melanoplus angustipennis (Dodge) -----	4 (Sup.)	196, 199, 205
		211, 215, 218, 219, 224
		228, 235, 239, 241, 251
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Melanoplus angustipennis impiger Scudd. -----	4 (Sup.)	243, 245, 246, 255
Melanoplus arizonae Scudd. -----	4 (Sup.)	235, 243, 255

Melanoplus bispinosus Scudd. -----	4 (Sup.)	243, 255
Melanoplus bivittatus (Say). -----	1	7
	3	62
	4	114-115
	4 (Sup.)	189, 195-270
	5	276-277
	7	423, 424
	10	627
Melanoplus bowditchi Scudd. -----	4 (Sup.)	197, 211, 228
		230, 235, 243
Melanoplus bowditchi bowditchi Scudd. -----	4 (Sup.)	267
Melanoplus bowditchi canus Hebard -----	4 (Sup.)	224, 267
Melanoplus cinereus Scudd. -----	4 (Sup.)	248, 249
Melanoplus confusus Scudd. -----	4	115
	4 (Sup.)	197, 215, 221, 224
		228, 239, 251, 264, 267
	5	276
Melanoplus dawsoni Scudd. -----	4 (Sup.)	197, 215, 218, 219
		224, 239, 241, 251, 264, 267
Melanoplus devastator Scudd. -----	3	61, 62
	4 (Sup.)	202, 203
		231-233, 248, 249
Melanoplus differentialis (Thos.) -----	1	7
	3	62
	4	114-115
	4 (Sup.)	180, 188, 191-200
		204-246, 250-261
		264, 267
	5	276-277
	7	423, 424
	9	547
	10	627
Melanoplus femur-rubrum (Deg.) -----	1	7
	4	115, 116
	4 (Sup.)	189, 192-243, 248
		251-255, 258-270
	6	354
	7	423, 424
Melanoplus flavidus Scudd. -----	4 (Sup.)	228, 243
Melanoplus flavidus flavidus Scudd. -----	4 (Sup.)	211, 215, 218
		239, 255, 264
Melanoplus foedus Scudd. -----	4 (Sup.)	189
Melanoplus foedus fluviatilis Brun. -----	4 (Sup.)	211, 228, 243
		251, 264, 268
Melanoplus foedus foedus Scudd. -----	4 (Sup.)	197, 199, 202
		203, 211, 224, 229, 230.
		235, 237, 243, 247, 248
		249, 251, 255, 268, 269
Melanoplus foedus iselyi Hebard -----	4 (Sup.)	211, 244, 245, 255
Melanoplus gladstoni Scudd. -----	4 (Sup.)	197, 218, 224
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Melanoplus glaucipes Scudd. -----	4 (Sup.)	244, 255
Melanoplus infantilis Scudd. -----	4 (Sup.)	197, 218, 223, 224, 226
		229, 235, 239, 251, 268

Melanoplus keeleri luridus (Dodge) -----	4 (Sup.)	208, 209, 211, 218 259, 261, 264, 265, 268
Melanoplus lakinus Scudd. -----	4 (Sup.)	195, 197, 199, 200 212, 229, 236, 237, 244 252, 256, 257, 259, 263
Melanoplus mexicanus Sauss. -----	1 3 4 4 (Sup.) 5 6 7 8 9 10	7 61, 62-63 114-116 179-270 275-277 355 423, 424 486 547 627
Melanoplus occidentalis (Thos.) -----	4 (Sup.)	197, 200, 212 225, 229, 236, 239 252, 256, 259, 268
Melanoplus packardii Scudd. -----	4 (Sup.)	189, 197-200, 208 212-213, 218, 221, 223-246 252-262, 268-269 423, 424
Melanoplus pictus Scudd. -----	4 (Sup.)	236
Melanoplus ponderosus Scudd. -----	4 (Sup.)	244, 245, 256
Melanoplus regalis Dodge -----	4 (Sup.)	197, 212, 229, 236, 244
Melanoplus scudderi (Uhler) -----	4 (Sup.)	252
Melanoplus scudderi scudderi (Uhler) -----	4 (Sup.)	197, 208, 221
Melanoplus sp. -----	4 (Sup.)	232 423
Melanoplus yarrowii Thos. -----	4 (Sup.)	259
Melanotus spp. -----	1 3 4 4 (Sup.) 5 8 9 6 6 7 8	7 64 115 232 280 515 579 407 383 451 501
Melanoxantherium smithiae (Monell) -----	4	144
	5	271, 280-281
	6	352, 378-379
	7	419, 421, 427-428
Melophagus ovinus (L.) -----	4	175
Menopon pallidum Nitz. -----	1	22
Mermiria maculipennis Rehn -----	4 (Sup.)	197, 212, 229, 230 236, 244, 245, 256 257, 259, 261, 268
Mermiria maculipennis macclungi Rehn -----	4 (Sup.)	197, 205, 208 225, 240, 252, 253



Mermiria neomexicana (Thos.) -----	4 (Sup.)	212, 229, 244
Meromyza americana Fitch -----	6	360
Mestobregma plattei Thos. -----	4 (Sup.)	236
Mestobregma plattei plattei Thos. -----	4 (Sup.)	229, 252, 256
Mestobregma sp. -----	4 (Sup.)	197
Metator pardalinus Sauss. -----	4 (Sup.)	197, 212, 225, 229, 236 240, 252, 259, 261, 268
Metoponium abnorme Lec. -----	3	80
Metzneria lappella L. -----	2	59
Microbracon mellitor (Say) -----	9	568
Micromyzus formosanus Takahashi -----	4	151
Microplectron fuscipennis Zett. -----	9	577
Mineola indigenella (Zell.) -----	1	9
	4	139
	6	370
	7	475
	8	493
	9	581
Miridae -----	1	11
Miris dolobratus (L.) -----	4	130
Mocis repanda F. -----	9	549
Monarthropalpus buxi Laboulb. -----	3	92-93
	4	168
	5	339
Monecphora bicincta (Say) -----	7	436
Monellia costalis (Fitch) -----	3	79
Monocesta coryli (Say) -----	1	16
	4	162
Monochamus notatus (Drury) -----	8	514
Monochamus spp. -----	8	514
Monochamus titillator (F.) -----	8	514
Monocrepidius auritus (Hbst.) -----	5	280
Monocrepidius spp. -----	4	118
Monomorium minimum (Buckl.) -----	2	57
	5	347
	6	417
	8	524
Monomorium pharaonis (L.) -----	1	23
	2	57
	7	479
	8	524
	9	586
Monophadnoides rubi (Harr.) -----	5	301
Monophadnus caryae Nort. -----	9	560
Monoptilota pergratialis (Hulst) -----	6	385
Mordwilkoja vagabunda (Walsh) -----	6	406
	7	470
Murgantia histrionica (Hahn) -----	1	12
	3	83-84
	4	149
	5	311
	6	386-387

<i>Murgantia histrionica</i> (Hahn) (Cont'd.) -----	7	420,450
	8	501
	9	565
<i>Mycetophagus flexuosus</i> Say -----	1	24
<i>Mycodiplosis alternata</i> Felt -----	2	52
<i>Mycophila</i> sp. -----	9	567
<i>Myochrous denticollis</i> (Say) -----	4	128
<i>Myodocha serripes</i> Oliv. -----	4	153
<i>Myzocallis asclepiadis</i> (Monell) -----	6	418
<i>Myzocallis bella</i> (Walsh) -----	6	404
	9	576
<i>Myzocallis kahawaluokalani</i> Kirk. -----	8	517
<i>Myzocallis tiliae</i> (L.) -----	7	466
	9	575
<i>Myzus cerasi</i> (F.) -----	3	77
	4	138-139
	5	299-300
	6	373
<i>Myzus persicae</i> (Sulz.) -----	1	12
	2	46,51,53
	5	299
<i>Myzus</i> sp. -----	3	95
	4	167
<i>Nacerda melanura</i> (L.) -----	3	102
	5	348
	6	417-418
	8	525
<i>Naupactus leucoloma</i> Boh.		
See <i>Pantomorus leucoloma</i> .		
<i>Naupactus</i> n. sp. -----	4	111,120
	8	487
<i>Neoborus illitus</i> Van D. -----	4	161
<i>Neoclytus caprea</i> (Say) -----	3	90
	8	509
<i>Neodiprion dyari</i> Rohw. -----	5	334
<i>Neodiprion lecontei</i> (Fitch) -----	5	334,335
	7	469
	8	514
	9	576
<i>Neodiprion pinetum</i> (Nort.) -----	9	576
<i>Neodiprion pini-rigidae</i> (Nort.) -----	9	576
<i>Neodiprion sertifer</i> (Geoff.) -----	5	334
	3	90
	6	405
<i>Neodiprion</i> spp. -----	5	334-335,336
	9	576
<i>Neolecanium cornuparvum</i> (Thro) -----	3	94
	6	410
	7	475
	9	582
<i>Nephelodes emmedonia</i> Cram. -----	4	120

<i>Neuroterus favosus</i> Bass. -----	6	404
<i>Neuroterus umbilicatus</i> Bass. -----	6	404
	8	513
<i>Nezara viridula</i> (L.) -----	4	154
	6	379
	7	446
	8	500
	9	562
Noctuidae -----	3	64-65
	4	111, 120-121
	5	281-282
	9	549
<i>Nodonota clypealis</i> Horn -----	5	339
<i>Nodonota puncticollis</i> Say -----	4	171
	5	292
	8	515
<i>Nysius ericae</i> (Schill.) -----	4	144
	5	305
	6	379
	7	446
	8	498
<i>Nygmia phaeorrhoea</i> (Donov.) -----	2	49
	8	509
	10	642
<i>Nymphula gyralis</i> Hulst -----	7	475
<i>Oberea bimaculata</i> (Oliv.) -----	2	41
	5	301
	8	495
<i>Oberea tripunctata</i> (Swed.) -----	5	301
	9	582
<i>Ochrosidia borealis</i> (Arrow) -----	9	548
<i>Odonaspis ruthae</i> Kot. -----	1	8
<i>Oecanthus nigricornis</i> Walk. -----	1	9
<i>Oedaleonotus enigma</i> (Scudd.) -----	3	61
	4	116
	4 (Sup.)	189, 202-203, 232 233, 248-249, 259
<i>Oestris ovis</i> L. -----	4	175
<i>Olene atomaria</i> Walk. -----	4	165
<i>Olene</i> sp. -----	4	164-165
<i>Oligotrophus salicifolius</i> Felt -----	5	337
<i>Omiodes accepta</i> Butl. -----	10	648
<i>Oncideres cingulatus</i> (Say) -----	8	497
Oniscidae -----	1	18
<i>Opeia obscura</i> Thos. -----	4 (Sup.)	197, 212, 218, 225 229, 236, 237, 240, 244 252, 258, 259, 261, 268
<i>Opistheuria clandestina</i> Van D. -----	8	500
<i>Opius striativentris</i> Gahan -----	4	169
<i>Ormenis pruinosa</i> (Say) -----	7	471
<i>Ornithodoros megnini</i> Duges -----	6	416
	9	584-585



Ornix geminatella Pack. -----	4	135
Orphulella pelidna (Burm.) -----	4 (Sup.)	197, 212, 218, 221
		225, 229, 236, 252
		256, 259, 264, 268
Orphulella sp. -----	4 (Sup.)	221, 222
Orphulella speciosa (Scudd.) -----	4 (Sup.)	193
		197, 205, 206, 208, 209
		212, 215, 218, 229, 240
		244, 252, 256, 257, 264
Orthaea bilobata (Say) -----	3	85
Orthaea sp. -----	3	85
Oryzaephilus surinamensis (L.) -----	1	23
Oxya chinensis Thun. -----	10	648
Pachylobius picivorus Germ. -----	4	165
Pachylobius sp. -----	1	7
Pachyipsylla celtidis-gemma Riley -----	4	163
Pachyipsylla celtidis-mamma Riley -----	8	518
Paleacrita vernata (Peck) -----	1	6, 15
	2	49
	4	158
	5	323
	6	397
Pamera longulus Dall. ....		
See Paromius longulus (Dall.).		
Pangaeus bilineatus (Say) -----	5	322
	7	455
Pantomorus godmani (Crotch) -----	2	40
	6	352, 391, 407
	9	545, 548
Pantomorus leucoloma (Boh.) -----	4	111, 120
	8	485, 487
Pantomorus peregrinus Buch. -----	8	487
Panzeria penitalis Coq. -----	8 (Sup.)	528, 534
Papaipema nebris nitela (Guen.) -----	6	364
	7	429
Papaipema purpurifascia (G. & R.) -----	7	473
Paraclemensia acerifoliella (Fitch) -----	8	513
Paraidemona mimica Scudd. -----	4 (Sup.)	256
Paralechia pinifoliella Chamb. -----	4	166
Paranthrene polistiformis Harr. -----	3	79
Paratetranychus bicolor Banks -----	8	513
Paratetranychus citri McG. -----	2	42
	9 (Sup.)	589-590
Paratetranychus ilicis McG. -----	4	168
	9 (Sup.)	589, 590-591
	5	338
	6	404
Paratetranychus pilosus (C. & F.) -----	3	75
	4	137
	7	437-438
	9 (Sup.)	589, 591-593

Paratetranychus pacificus McG.		
See Tetranychus pacificus.		
Paratetranychus sp. -----	1	20
Paratetranychus uniunguis Jacobi -----	3	91
	4	166
	5	336
	6	406
	7	470
Paratetranychus yothersi McG. -----	9	581
Paratrechina longicornis (Latr.) -----	3	100
Paratrioza cockerelli (Sulc) -----	1	11-12
	2	45
	4	146, 170
	5	308
	6	383
	7	447
	9	564
Parcoblatta pennsylvanica (Deg.) -----	5	349
Pardalophora haldemanii (Scudd.) -----	4 (Sup.)	208, 212, 221, 240
		244, 252
	5	277
Pardalophora phoenicoptera (Burm.) -----	4 (Sup.)	221
Pariatoria oleae Cblv. -----	2	53
Paromitus longulus (Dall.) -----	1	14
	3	85
Peropomala wyomingensis Thos. -----	4 (Sup.)	197, 268
Paurocephala ilicis (Ashm.) -----	2	52
Pectinophora gossypiella (Saund.) -----	1	6, 15
	2	48
	3	87
	4	156
	5	320
	6	395
	7	420, 459
	8	506
	9	569
Pegomya hyoscyami (Panz.)	5	315
	6	390
Pegomya rubivora (Coq.) -----	4	140
Pelamia latipes Guen. -----	9	555
Pelidnota punctata (L.) -----	6	376
Pemphigus betae (Doane) -----	1	14
	9	567
Peranabrus scabricollis (Thos.) -----	4	116
Peregrinus maidis (Ashm.) -----	4	131
	7	433
	8	490
Pergandeidia trirhoda Walk. -----	5	340
	7	473
	9	581

<i>Periphyllus lyropictus</i> (Kess.) -----	1	17
	7	467
	8	513
	9	575
<i>Periphyllus negundinis</i> (Thos.) -----	5	328
<i>Periphyllus populicola</i> (Thos.) -----	8	510
<i>Periplaneta australasiae</i> (F.) -----	7	480
<i>Perkinsiella saccharicida</i> Kirk. -----	10	648
<i>Petrova comstockiana</i> (Fern.) -----	5	334
	6	405
	9	577
<i>Phasmidae</i> -----	4	165
	9	546, 572
<i>Philaenus leucophthalmus</i> (L.) -----	5	283
<i>Phlibostroma quadrimaculatum</i> Thos. -----	4 (Sup.)	197, 212, 213, 225 229, 236, 237, 240, 244 245, 252, 256, 268, 269
<i>Phloesinus dentatus</i> (Say) -----	7	474
<i>Phlyctaenia rubigalis</i> (Guen.) -----	7	453
<i>Phoetalioteles nebrascensis</i> (Thos.) -----	4 (Sup.)	197, 199, 202, 208, 212 218, 225, 229, 232, 236 240, 248, 252, 256, 259 264, 268
<i>Pholus satellitia pandorus</i> Hbn. -----	7	462
<i>Phormia</i> sp. -----	2	55
<i>Phorodon humuli</i> (Schr.) -----	4	151
<i>Phyllaphis fagi</i> (L.) -----	5	327
<i>Phthirus pubis</i> (L.) -----	9	584
<i>Phyllobius oblongus</i> L. -----	5	292
<i>Phyllocoptes minutissimus</i> Hods. -----	6	404
<i>Phyllocoptes oleivorus</i> Ashm. -----	1	10
	2	42
	3	80
	9	560
<i>Phyllocoptes quadripes</i> Shim. -----	4	164
<i>Phyllophaga anxia</i> Lec. -----	3 (Sup.)	105
<i>Phyllophaga balia</i> (Say) -----	3 (Sup.)	105-107
<i>Phyllophaga calceata</i> Lec. -----	4	117
<i>Phyllophaga crenulata</i> (Froel.) -----	3 (Sup.)	105
<i>Phyllophaga drakei</i> Kby. -----	3 (Sup.)	105
<i>Phyllophaga ephilida</i> (Say) -----	6	356
<i>Phyllophaga fervida</i> (F.) -----	4	117
	6	356
<i>Phyllophaga forsteri</i> Burm. -----	3 (Sup.)	105
<i>Phyllophaga fusca</i> (Froel.) -----	3 (Sup.)	104-109
	6	356
<i>Phyllophaga futilis</i> Lec. -----	3 (Sup.)	105
<i>Phyllophaga hirticula</i> (Knoch) -----	3 (Sup.)	104-109
	4	117
	6	356
<i>Phyllophaga ilicis</i> (Knoch) -----	3 (Sup.)	105-108
<i>Phyllophaga implicita</i> Horn -----	3 (Sup.)	105



Phyllophaga inversa Horn -----	3 (Sup.)	105
	4	117
Phyllophaga lanceolata (Say) -----	3	66
	4	125
	5	278
Phyllophaga marginalis Lec. -----	3 (Sup.)	105
Phyllophaga nitida (Lec.) -----	3 (Sup.)	105
Phyllophaga prunina Lec. -----	3 (Sup.)	104-106
Phyllophaga quercus (Knoch) -----	6	356
Phyllophaga rugosa (Melsh.) -----	3 (Sup.)	104-109
	6	356
Phyllophaga spp. -----	1 (Sup.)	25
	3 (Sup.)	105
	4	111, 117-118
	5	278
	6	351, 356
	7	425
	9	548
Phyllophaga spreta Horn -----	3 (Sup.)	105
Phyllophaga tristis (F.) -----	3 (Sup.)	104-107
Phyllophaga villifrons Lec. -----	3 (Sup.)	105
Phyllotreta aerea Allard -----	7	445
Phyllotreta albionica (Lec.) -----	5	274
Phyllotreta pusilla Horn -----	4	143
	5	304
Phyllotreta sinuata (Steph.) -----	5	304
Phyllotreta spp. -----	7	422, 445
Phyllotreta vittata (F.) -----	4	143
	5	304
	7	445
Phyllotreta vittata discedens Weise -----	9	566
Phyllotreta zimmermani (Crotch) -----	7	445
Phylloxera caryaecaulis Fitch -----	4	142
	5	331
	7	466
	8	512
	9	574
Phylloxera devastatrix Perg. -----	4	141
	6	376
Phylloxera spp. -----	4	141-142
Phylloxera vitifoliae Fitch -----	6	375
	8	496
Physostegania pustularia Guen. -----	5	323
Phytomyza ilicis Curt. -----	1	19
	2	52
	3	93
	4	169
Phytomyza minuscula Gour. -----	5	340
	6	409
	7	473
	8	517

Phytophaga destructor (Say) -----	3	66
	4	112, 122-123
	5	271, 284
	6	359
	7	419, 430
	7 (Sup.)	483-484
	8	489
	9	552
	10	629
Phytophaga rigidae O.S. -----	2	53
Phytophaga sp. -----	5	336
Pieris rapae (L.) -----	2	45
	3	83
	7	450
Pineus pinifoliae (Fitch) -----	8	514
	9	578
Pineus strobi (Htg.) -----	5	335
	7	469-470
	8	514
	9	577
Pinnaspis aspidistrae (Sign.) -----	1	19
	7	473
	8	518
Pissodes nemorensis Germ. -----	2	52
Pissodes sp. -----	1	7
Pissodes strobi (Peck) -----	5	334
	6	405
	7	468
Pityophthorus confinis Lec. -----	4	165
Plagioderia versicolora (Laich.) -----	6	407
	5	337
	8	515
Plathypena scabra (F.) -----	1	7
	9	555
Platycotis vittata F. -----	9	573
Platypsyla castoris Rits. -----	5	347
Plutella maculipennis (Curt.) -----	1	6, 12
	2	45
	3	83
	4	148
	8	501
Pnigodes setosus Lec. -----	4	152
Podosesia syringae (Harr.) -----	3	94
	4	169
	5	341
	6	410
	7	475
Pogonomyrmex barbatus (F. Smith) -----	3	70
	5	348
	8	524
	9	586

<i>Pogonomyrmex barbatus</i> var. near		
<i>molefaciens</i> Buckley -----	7	480
<i>Pogonomyrmex occidentalis</i> (Cress.) -----	4	176
	5	348
	6	417
<i>Pogonomyrmex</i> spp. -----	3	70
<i>Polistes pallipes</i> Lep. -----	2	57
<i>Polycaon confertus</i> Lec. -----	4	142
<i>Polychrosis viteana</i> (Clem.) -----	4	140
	5	302
	6	375
	7	443
	8	496
	9	559
<i>Pomphopoea sayi</i> (Lec.) -----	4	132
<i>Popillia japonica</i> Newm. -----	1 (Sup.)	25-28
	3	63-64
	4	111-119
	5	271, 278-279
	6	351, 357-358
	7	419, 425-426
	8	486
	9	547-548
	10	631-632
<i>Porosagrotis orthogonia</i> (Morr.)		
<u>See</u> <i>Agrotis orthogonia</i> .		
<i>Porosagrotis</i> sp. -----	5	282
<i>Porthetria dispar</i> (L.) -----	3	89
	4	160
	5	325
	6	398
	7	461
	8	509
	9	571-572
	10	642
<i>Prenolepis imparis</i> (Say) -----	2	57
	3	101
<i>Prenolepis</i> sp. -----	2	57
<i>Prionus fissicornis</i> Hald. -----	6	359
<i>Prionus laticollis</i> (Drury) -----	8	519
<i>Prionoxystus robiniae</i> (Peck) -----	1	17
	2	50
	6	399
	8	509
<i>Priophorus acericaulis</i> (MacG.) -----	5	332
<i>Pristiphora geniculata</i> Htg. -----	7	468
	8	513
<i>Prociphilus fraxini-dipetelae</i> Essig -----	4	160
<i>Prociphilus tessellatus</i> (Fitch) -----	6	403
<i>Prodenia eridania</i> Cram. -----	9	549
<i>Prodenia litura</i> (F.) -----	7	460
<i>Prodenia ornithogalli</i> Guen. -----	8	488



<i>Profenusa canadensis</i> (Marlatt) -----	5	300
<i>Prosenia siberita</i> F. -----	1 (Sup.)	26
<i>Proteides clarus</i> (Cram.) -----	2	35
<i>Proteoteras aesculana</i> Riley -----	9	575
<i>Protoparce quinquemaculata</i> (Haw.) -----	5	316
	6	382
	7	446
	8	504
	9	564
<i>Protoparce sexta</i> (Johan.) -----	4	154
	5	307, 316
	7	446
	8	499, 504
	9	564
<i>Protoparce</i> spp. -----	5	307, 316
	6	382
	7	420, 446-447
	8	499, 504
	9	564
<i>Protopulvinaria pyriformis</i> (Ckll.) -----	2	51
	3	80
<i>Psallus seriatus</i> (Reut.) -----	2	48
	3	87-88
	4	156
	5	321-322
	6	395
	7	420, 459-460
	9	569
	10	640
<i>Pseudaonidia duplex</i> (Ckll.) -----	4	168
<i>Pseudococcus boninsis</i> Kuw. -----	4	131
<i>Pseudococcus brevipes</i> (Ckll.) -----	6	408
<i>Pseudococcus citri</i> (Risso) -----	1	18
	9	564
<i>Pseudococcus comstocki</i> (Kuw.) -----	6	400
	7	465, 472
	9	545, 557
	10	634
<i>Pseudococcus cuspidatae</i> Rau -----	6	412
<i>Pseudococcus solani</i> Ckll. -----	7	448
<i>Pseudococcus</i> spp. -----	7	472
	8	494, 499
<i>Pseudohazis hera</i> Harr. -----	6	353, 418
<i>Pseudohazis</i> sp. -----	6	353
<i>Pseudopomala brachyptera</i> (Scudd.) -----	4 (Sup.)	218, 229
<i>Psila rosae</i> (F.) -----	6	388
<i>Psilocorsis faginella</i> Chamb. -----	9	572-573
<i>Psinidia fenestralis</i> (Serv.) -----	4 (Sup.)	218
<i>Psoloessa delicatula delicatula</i> Scudd. -----	4 (Sup.)	197
<i>Psoloessa</i> sp. -----	4 (Sup.)	236
<i>Psorophora ciliata</i> F. -----	8	519

Psorophora columbiae D. & K. -----	6	413
	7	476
	8	519, 520
Psorosina hammondi (Riley) -----	5	295
Psylla pyricola (Foerst.) -----	3	77
	5	300
	6	374
	8	485, 495
	10	633-634
Pterocyclon mali Fitch -----	4	160
Pteronidea ribesii (Scop.) -----	4	140
Pterophorus periscelidactylus (Fitch) -----	5	302
Ptilonyssus sp. -----	3	99
Ptinus spp. -----	3	101
Ptinus tectus Boield. -----	3	101
	8	525
Ptychodes trilineatus (L.) -----	6	377
Pulex irritans L. -----	3	96
Pulvinaria acericola Walsh & Riley -----	5	333
Pulvinaria vitis (L.) -----	4	164, 167
	5	332-333
	6	403
	7	467
Pyrausta ainsliei Heinr. -----	8 (Sup.)	534
Pyrausta nubilalis (Hbn.) -----	3	66-67
	4	126-127
	5	287-288
	6	351, 363-364
	7	419, 422, 432-433
	8	490
	8 (Sup.)	527-534, 535-538
	9	545, 553-554
	9 (Sup.)	603-612, 621-626
	10 (Sup.)	649-650
Pyrausta penitalis Grote -----	8 (Sup.)	534
Recurvaria apictripunctella Clem. -----	4	163
	6	400
Reticulitermes flavipes Koll. -----	1	22
	2	56-57
	3	99-100
	4	177
	5	347
	6	406
	7	479
	9	574
Reticulitermes spp. -----	1	22
Reticulitermes tibialis Banks -----	1	22
	3	100
	4	177

Reticulitermes tibialis Banks (Cont'd.) -----	5	314
	7	454
	8	511
Rhabdocnemis obscura Bdv. -----	10	643
Rhagoletis cingulata (Loew) -----	5	299
	6	373
	7	442
Rhagoletis fausta (O.S.) -----	5	299
Rhagoletis pomonella (Walsh) -----	5	296
	6	371
	7	440
	8	493
	9	557
Rhagoletis spp. -----	5	299
	6	373
Rhipicephalus sanguineus (Latr.) -----	1	22
	2	54
	6	414
	7	477
	8	521
	9	584
Rhizoglyphus hyacinthi Bdv. -----	1	18
	3	94
	8	518
	9	582
Rhizoglyphus phylloxerae Riley -----	4	154
Rhodites dichlocerus (Harr.) -----	5	343
Rhodites rosae (L.) -----	7	475
Rhodaenus tredecimpunctatus (Ill.) -----	7	473
Rhopalosiphum melliferum Hottes -----	5	340
Rhopalosiphum nymphaeae (L.) -----	6	412
Rhopalosiphum prunifoliae (Fitch) -----	3	74 - 75
	4	135, 136, 137
	5	274, 296
	10	632
Rhopalosiphum pseudobrassicae (Davis) -----	1	6, 13
	6	389
Rhopalosiphum sp. -----	3	88
Rhopobota naevana (Hbn.) -----	5	301
Rhyacionia buoliana (Schiff.) -----	3	90
	5	334
	6	405
Rhyacionia frustrana (Comst.) -----	6	404-405
	7	468-469
	9	577
Rhyacionia sp. -----	7	469
Rhynchaenus pallicornis (Say) -----	4	135
Rhynchites bicolor (F.) -----	5	342
Rhynchites velatus Lec. -----	6	418
Rodolia cardinalis (Muls.) -----	5	303
Romalea microptera (Beauv.) -----	3	62



<i>Saccharosydne saccharivora</i> Westw. -----	7		436
<i>Saissetia oleae</i> (Bern.) -----	5		303
	6		377
<i>Saperda candida</i> F. -----	8		493
<i>Saperda vestita</i> Say -----	5		332
<i>Sarcophaga kellyi</i> Ald. -----	5		275
	6		355
	7		424
<i>Scapteriscus acletus</i> R. & H. -----	1		11
	5		305
<i>Scapteriscus</i> spp. -----	1		11
	4		168
<i>Scapteriscus vicinus</i> Scudd. -----	3		81
<i>Scelio pambertoni</i> Timb. -----	10		648
<i>Schistocerca alutacea</i> (Harr.) -----	4 (Sup.)	205, 221, 229, 264	
<i>Schistocerca americana</i> (Drury) -----	4 (Sup.)	193-194, 256	
	6		355
<i>Schistocerca americana americana</i> (Drury)---	4 (Sup.)	205, 206, 208	
		212, 221, 222, 244	
<i>Schistocerca lineata</i> Scudd. -----	4 (Sup.)	197, 208, 212, 221	
		229, 232, 236, 244, 256	
<i>Schistocerca obscura</i> (F.) -----	4 (Sup.)	244, 245, 256	
	8		486
<i>Schistocerca shoshone</i> (Thos.) -----	4 (Sup.)	232, 244, 259, 261	
<i>Schistocerca</i> sp. -----	4 (Sup.)	189, 218, 219	
<i>Schizomyia coryloides</i> Walsh & Riley -----	7		443
<i>Schizura concinna</i> (A. & S.) -----	7		437
<i>Sciara inconstans</i> Fitch -----	1		20
<i>Scirtetica marmorata marmorata</i> Harr. -----	4 (Sup.)		215
<i>Scirtothrips citri</i> (Moult.) -----	4		142
	5		303
<i>Scobicia declivis</i> (Lec.) -----	4		177
<i>Scolothrips</i> sp. -----	5		340
<i>Scolytidae</i> -----	8		513-514
<i>Scolytus multistriatus</i> Marsham -----	5		329
	6		401
	8		511
	10		644-645
<i>Scolytus quadrispinosus</i> Say -----	5		331
<i>Scolytus rugulosus</i> Ratz. -----	4		131
	7		437
	8		492
	9		556
<i>Scutigera forceps</i> Raf. -----	2		58
<i>Scutigeraella immaculata</i> (Newp.) -----	4		144
<i>Serica similis</i> Lewis -----	8		487
<i>Sericothrips variabilis</i> Beach -----	4		157
<i>Sesamia cretica</i> Led. -----	4		131
<i>Sibine stimulea</i> (Clem.) -----	8		516
<i>Silpha bituberosa</i> Lec. -----	5		315
<i>Simuliidae</i> -----	3		97
	4		175
	5		347

Simulium bivittatum Mall. -----	5	347
Simulium sp. -----	3	97
Sipha flava Forbes -----	4	130
	7	436
Siphonaptera -----	4	173
Sitona cylindricollis Fahraeus -----	5	274
Sitona flavescens Marsham -----	6	407
Sitotroga cerealella (Oliv.) -----	1	24
	9	587
Solenopsis geminata (F.) -----	4	176
	6	408
Solenopsis molesta (Say) -----	6	375-376
	7	479
Solenopsis xyloni (McCook) -----	3	100
	4	176
	5	347, 348
	6	417
	7	479
	8	524
Spharagemon bolli Scudd. -----	4 (Sup.)	256
Spharagemon collare (Scudd.) -----	4 (Sup.)	197, 205, 208, 212
		215, 216, 218, 225, 229
		232, 236, 240, 244, 252
		259, 261, 264, 265, 268
Spharagemon cristatum cristatum Scudd. -----	4 (Sup.)	256
Spharagemon equale Say -----	4 (Sup.)	197, 212, 218, 225
		229, 236, 240, 244
		252, 256, 260, 268
Sphinx lineata F. -----	5	282
	6	359
	8	516
Spilonota ocellana (D. & S.) -----	3	73
	4	135
Stegobium paniceum (L.) -----	5	348
	6	417
	9	587
Stephanitis rhododendri Horv. -----	4	170
	5	342
	7	475
Sternochetus lapathi (L.) -----	1	17
	5	337
	6	407
	7	470
	8	515
	9	578
Stictocephala festina (Say) -----	3	69
	6	366
	8	500
Stigmaeus floridanus Banks -----	7	444
Stilpnotia salicis (L.) -----	7	422
	10	642

Stomatolydella infernalis Towns. -----	9	566
Stomoxys calcitrans (L.) -----	2	55
	4	174
	5	346
	6	415
	7	478
	8	522
	9	585
Strigoderma arboricola (F.) -----	6	365
Supella supellectilium (Serv.) -----	4	177
	7	480
	8	525
	9	586
Sympiesis felti Crawf. -----	4	169
Syntomeida epilais Walk. -----	1	20
	9	583
Syntomeida epilais jucundissima Dyar -----	8	519
Syrbula admirabilis (Uhl.) -----	4 (Sup.)	193, 194, 205
		206, 208, 212, 221, 229
		236, 244, 254-257, 264
Systema blanda (Melsh.) -----	5	304
Systema hudsonias (Forst.) -----	4	156
	6	407
Systema taeniata (Say) -----	5	304
Tabanidae -----	7	478-479
Tabanus atratus F. -----	8	523
Tabanus punctifer O.S. -----	6	416
Tabanus productus Hine -----	6	416
Tabanus sonomensis O.S. -----	6	416
Tabanus spp. -----	5	346
Tabanus sulcifrons Macq. -----	6	416
Tachycines asynamorus Adel. -----	9	587
Tachypterellus quadrigibbus (Say) -----	5	295
	6	370
Taeniopteryx pacifica Banks -----	3	78
Taeniothrips inconsequens (Uzel) -----	3	77-78
	4	139
Taeniothrips simplex (Morison) -----	1	19
	2	52
	3	93
	4	167
	6	409
	7	474
	8	518
	9	581-582
	10	640
Taniva albolineana Kearf. -----	3	91
	4	166
	5	336
	9	578
Tarsonemus pallidus Banks -----	3	92
	7	472



Tarsonemus sp. -----	9	567
Thecodiplosis mosellana Gehin -----	9	553
Tenebrio obscurus F. -----	1	23
Tenebrionidae -----	4	146
Tenebroides mauritanicus (L.) -----	1	23
	7	481
	8	525
Tenthredinidae -----	6	405
Terastia meticulosalis Guen. -----	2	51
Tetanops aldrichi Hendel -----	4	154
	6	391
Tetraleurodes mori (Quaint.) -----	4	168
	9	575
Tetralopha sp. -----	8	513
Tetramorium caespitum (L.) -----	4	176
	5	347
Tetranobia longipes (Banks) -----	4	125
Tetranychina mcdonoughi McG. -----	3	69
Tetranychina tritici (Ewing) -----	4	112, 125
Tetranychus pacificus McG. -----	3	71
	7	132
	9 (Sup.)	438
Tetranychus sexmaculatus Riley -----	2	589, 593-594
Tetranychus sp. -----	3	43
Tetranychus telarius (L.) -----	1	65
	2	6, 13
	3	47
	4	65, 85
	9 (Sup.)	122
Tetranychus willamettei McG. -----	4	589, 594-560
	9	141
Theobaldia incidens (Thoms.) -----	2	558
	3	54
Thoracaphis umbellulariae Essig -----	7	97
Thripidae -----	9	474
Thrips tabaci Lind. -----	1	581
	2	13
	3	46
	4	81, 84, 92
	5	141, 151-152
	6	314
	7	352, 389
	8	420, 422, 453
	9	502
Thyanta custator (F.) -----	9	564, 582
Thylodrias contractus Mots. -----	6	551
	9	417
Thyridopteryx ephemeraeformis (Haw.) -----	1	587
	6	16
	7	398-399
	8	462-463
Thyrillus pacificus (Uhl.) -----	4	509
	5	124
		286

Thysanoptera -----	3		93,95
	4		130,157,167
	5		290-291,322,332
	6		411
Tineola walsinghami Busck -----	5		349
	6		417
	9		587
Tiphia popilliavora Rohw.-----	1	(Sup.)	27-28
Tiphia vernalis Rohw.-----	1	(Sup.)	26-27
Tomostethus multicinctus Rohw. -----	4		160
Tortricidae -----	5		315
Tortrix cockerellana Kearf. -----	6		400
Toumeyella liriodendri (Gmel.) -----	6		406
	9		583
Toumeyella numismaticum P. & McD. -----	5		335
	6		405
Toumeyella parvicorne Ckll. -----	7		470
Toumeyella turgida Ckll. -----	3		94
	4		170
Toxoptera graminum Rond. -----	3		66
	4		112,124
	7		419,431
Toxotrypana curvicauda Gerst. -----	5		303
Trachinus tabidus (F.) -----	7		419,430-431
Trachyrachis kiowa Thos. -----	4	(Sup.)	218,258
Trachyrachis kiowa fuscifrons (Stal) -----	4	(Sup.)	205,208,212,221,236
			240,244,256,257,264
Trachyrachis kiowa kiowa Thos. -----	4	(Sup.)	197,200,208
			212,225,229,232,236
			252,260,261,264,268
Trachyrachis sp. -----	4	(Sup.)	197,236
Tremex columba (L.) -----	8		511
	9		572
Trialeurodes sp. -----	4		157
Trialeurodes vaporariorum (Westw.) -----	3		92
Triaspis curculionis (Fitch) -----	7		453
Tribolium confusum Duv. -----	1		23
	2		59
Tribolium madens (Charp.) -----	5		349
	9		587
Trichiotinus piger (F.) -----	6		410
Trichobaris trinotata (Say) -----	6		381
	7		453
Trichogramma sp. -----	8		496
Trifidaphis phaseoli (Pass.) -----	4		156
Trimerotropis agrestis McN. -----	4	(Sup.)	198
Trimerotropis caeruleipennis Brun. -----	4	(Sup.)	232
Trimerotropis citrina Scudd. -----	4	(Sup.)	244
Trimerotropis formosus Say.			
See Tropidolophus formosus Say.			
Trimerotropis gracilis Thos. -----	4	(Sup.)	236,268
Trimerotropis laticincta Sauss.-----	4	(Sup.)	198,212,225
			236,252,260,268

Trimerotropis latifasciata laticincta -----	4 (Sup.)	244, 256
Trimerotropis melanoptera -----	4 (Sup.)	236, 260
Trimerotropis pallidipennis Burm. -----	4 (Sup.)	198, 225, 232, 233 236, 244, 256, 260, 261
Trimerotropis pallidipennis pallidipennis -----	4 (Sup.)	268
Trimerotropis sp. -----	4 (Sup.)	232, 248
Trimerotropis sparsa Thos. -----	4 (Sup.)	260
Trimerotropis strenua McN. -----	4 (Sup.)	260
Trimerotropis suffusus Scudd. -----	4 (Sup.)	260
Troctes divinatorius (Mull.) -----	1	24
Trombicula tlalzahuatl Murray -----	6	414
Trombidium magnificum Lec. -----	8	521
Tropaea luna L. -----	2	59
Tropidolophus formosus Say -----	4 (Sup.)	198, 236, 256
Tuberculatus ulmifolii (Monell) -----	8	511
Tychius griseus Schaeffer -----	6	367
Tychius picirostris (F.) -----	9	545, 554-555
Tyloderma fragariae (Riley) -----	2	47
	6	390
	7	455
Typhlocyba pomaria McA. -----	7	439
	8	493
	9	557
Typophorus viridicyaneus (Crotch) -----	8	503
Udeopsylla robusta Hald. -----	5	349
Urbanus proteus (L.) -----	2	45
Uscana semifumipennis Gir. -----	2	59
Vespa crabro L. -----	9	582
Wasmannia auropunctata (Roger) -----	3	100
	5	347
	7	479
Wohlfahrtia vigil Walk. -----	7	479
Wyeomyia smithii Coq. -----	6	413
Xanthippus corallipes Hald. -----	4 (Sup.)	198, 236
Xanthippus corallipes pantherinus Scudd. -----	4 (Sup.)	244, 256
Xanthopastis timais (Cram.) -----	3	94
	5	341
	6	410
Xenopsylla cheopis (Rothsch.) -----	2	54
Xyletinus peltatus (Harr.) -----	2	59
Xylocrius agassizi Lec. -----	3	78
Xylotrechus quadrimaculatus (Hald.) -----	7	463
Xylotrechus sagittatus (Germ.) -----	5	349
Zenillia caesar Ald. -----	8 (Sup.)	528, 534
Zonosemata electa (Say) -----	1	11
Zootermopsis angusticollis Hagen -----	3	100
Zophodia convolutella (Hbn.) -----	6	375



The common names approved by the American Association of Economic Entomologists are indicated by the letters a.n.o. (American name, official).

Alfalfa caterpillar a.n.o.-----	<i>Colias eurytheme</i> Bdv.
Alfalfa snout beetle a.n.o.-----	<i>Brachyrhinus ligustici</i> (L.)
Alfalfa weevil a.n.o.-----	<i>Hypera postica</i> (Gyll.)
American dog tick a.n.o.-----	<i>Dermacentor variabilis</i> (Say)
Angoumois grain moth a.n.o.-----	<i>Sitotroga cerealella</i> (Oliv.)
Apple aphid a.n.o.-----	<i>Aphis pomi</i> Deg.
Apple curculio a.n.o.-----	<i>Tachypterellus quadrigibbus</i> (Say)
Apple flea weevil a.n.o.-----	<i>Rhynchaenus pallicornis</i> (Say)
Apple grain aphid a.n.o.-----	<i>Rhopalosiphum prunifoliae</i> (Fitch)
Apple leaf-curling midge-----	<i>Dasyneura mali</i> Kieff.
Apple leaf skeletonizer a.n.o.-----	<i>Psorosina hammondi</i> (Riley)
Apple maggot a.n.o.-----	<i>Rhagoletis pomonella</i> (Walsh)
Apple twig borer a.n.o.-----	<i>Schistoceros hamatus</i> (F.)
Arborvitae aphid-----	<i>Lachnus thujaefilina</i> Del G.
Arborvitae leaf miner a.n.o.-----	<i>Argyresthia thuiella</i> (Pack.)
Argentine ant a.n.o.-----	<i>Iridomyrmex humilis</i> Mayr
Arizona ash tingid-----	<i>Leptotypha minor</i> McA.
Armyworm a.n.o.-----	<i>Girphis unipuncta</i> (Haw.)
Asiatic garden beetle a.n.o.-----	<i>Autoserica castanea</i> (Arrow)
Asparagus beetle a.n.o.-----	<i>Crioceris asparagi</i> (L.)
Asparagus miner a.n.o.-----	<i>Agromyza simplex</i> Loew
Australian cockroach a.n.o.-----	<i>Periplaneta australasiae</i> (F.)
Avocado red mite a.n.o.-----	<i>Paratetranychus yothersi</i> McG.
Azalea leaf miner-----	<i>Gracilaria azaleella</i> Brants.
Azalea scale-----	<i>Eriococcus azaleae</i> Comst.
Bagworm a.n.o.-----	<i>Thyridopteryx ephemeraeformis</i> (Haw.)
Banded ash borer-----	<i>Neoclytus caprea</i> (Say)
Banded cucumber beetle a.n.o.-----	<i>Diabrotica balteata</i> Lec.
Banded greenhouse thrips a.n.o.-----	<i>Hercinothrips femoralis</i> (Reut.)
Beaked willow gall-----	<i>Phytophaga rigidae</i> O.S.
Bean aphid a.n.o.-----	<i>Aphis rumicis</i> L.
Bean leaf beetle a.n.o.-----	<i>Cerotoma trifurcata</i> (Forst.)
Bean leaf roller a.n.o.-----	<i>Urbanus proteus</i> (L.)
Bean thrips a.n.o.-----	<i>Hercotrips fasciatus</i> (Perg.)
Bean weevil a.n.o.-----	<i>Acanthoscelides obtectus</i> (Say)
Bedbug a.n.o.-----	<i>Cimex lectularius</i> L.
Beech leaf skeletonizer-----	<i>Psilocorsis faginella</i> Chamb.
Beech scale a.n.o.-----	<i>Cryptococcus fagi</i> (Baer.)
Beech woolly aphid-----	<i>Phyllaphis fagi</i> (L.)
Beet leafhopper a.n.o.-----	<i>Eutettix tenellus</i> (Bak.)
Beet webworm a.n.o.-----	<i>Loxostege sticticalis</i> (L.)
Birch leaf miner-----	<i>Fenusa pumila</i> Klug
Birch skeletonizer a.n.o.-----	<i>Bucculatrix canadensisella</i> Chamb.
Black carpenter ant a.n.o.-----	<i>Camponotus herculeanus pennsylvanicus</i> (Deg.)
Black carpet beetle a.n.o.-----	<i>Attagenus piceus</i> (Oliv.)
Black cherry aphid a.n.o.-----	<i>Myzus cerasi</i> (F.)
Black grain stem sawfly a.n.o.-----	<i>Trachelus tabidus</i> (F.)

Black-headed fireworm a.n.o.-----	Rhopobota naevana (Hbn.)
Black-horned tree cricket a.n.o.-----	Oecanthus nigricornis Walk.
Black horsefly a.n.o.-----	Tabanus atratus F.
Black-legged tick a.n.o.-----	Ixodes ricinus scapularis Say
Black pecan aphid a.n.o.-----	Melanocallis caryaefoliae (Davis)
Black scale a.n.o.-----	Saissetia oleae (Bern.)
Black vine weevil a.n.o.-----	Brachyrhinus sulcatus (F.)
Black widow spider a.n.o.-----	Latrodectus mactans (F.)
Blue-sided tent caterpillar-----	Malacosoma constricta (Stretch)
Boll weevil a.n.o.-----	Anthonomus grandis Boh.
Bollworm a.n.o.-----	Heliothis armigera (Hbn.)
Booklouse a.n.o.-----	Troctes divinatorius (Müll.)
Boxelder aphid a.n.o.-----	Periphyllus negundinis (Thos.)
Boxelder bug a.n.o.-----	Leptocoris trivittatus (Say)
Boxwood leaf miner a.n.o.-----	Monarthropalpus buxi Laboulb.
Branch and twig borer-----	Polycnion confertus Lec.
Bristly rose slug a.n.o.-----	Cladius isomerus Nort.
Broad-horned flour beetle-----	Gnathocerus cornutus (F.)
Broad-necked root borer a.n.o.-----	Prionus laticollis (Drury)
Bronzed birch borer a.n.o.-----	Agrilus anxius Gory
Brown-banded cockroach-----	Supella supellectilium (Serv.)
Brown dog tick a.n.o.-----	Rhipicephalus sanguineus Latr.
Brown-tail moth a.n.o.-----	Nygma phaeorrhoea (Donov.)
Buffalo treehopper a.n.o.-----	Ceresa bubalus (F.)
Bulb mite a.n.o.-----	Rhizoglyphus hyacinthi Bdv.
Bumble flower beetle a.n.o.-----	Euphoria inda (L.)
Cabbage curculio a.n.o.-----	Ceutorhynchus rapae Gyll.
Cabbage looper a.n.o.-----	Autographa brassicae (Riley)
Cabbage maggot a.n.o.-----	Hylemya brassicae (Bouche)
Cabbage webworm a.n.o.-----	Hellula undalis (F.)
Cadelle a.n.o.-----	Tenebroides mauritanicus (L.)
California red scale a.n.o.-----	Aonidiella aurantii (Mask.)
Camellia scale-----	Lepidosaphes camelliae Hoke
Camphor scale a.n.o.-----	Pseudonidia duplex (Ckll.)
Carpenter worm a.n.o.-----	Prionoxystus robiniae (Peck)
Carrot beetle a.n.o.-----	Ligyrus gibbosus (Deg.)
Carrot rust fly a.n.o.-----	Psila rosae (F.)
Catalpa midge a.n.o.-----	Cecidomyia catalpae (Comst.)
Catalpa sphinx a.n.o.-----	Ceratonia catalpae (Bdv.)
Cat flea a.n.o.-----	Ctenocephalides felis (Bouche)
Cattle biting-louse a.n.o.-----	Bovicola bovis (L.)
Cedar bark beetle-----	Phloeosinus dentatus (Say)
Chaff scale a.n.o.-----	Parlatoria pergandii Comst.
Chain-spotted geometer a.n.o.-----	Cingilia catenaria (Drury)
Changa a.n.o.-----	Scapteriscus vicinus Scudd.
Cherry fruitfly a.n.o.-----	Rhagoletis cingulata (Loew)
Cherry fruitworm a.n.o.-----	Grapholitha packardii Zell.
Cherry scale a.n.o.-----	Aspidiotus forbesi Johns.
Chicken mite a.n.o.-----	Dermanyssus gallinae (Deg.)
Chigger a.n.o.-----	Eutrombicula alfreddugesi (Oud.)
Chinch bug a.n.o.-----	Blissus leucopterus (Say)
Chokecherry midge-----	Contarinia virginianiae Felt



Chrysanthemum aphid a.n.o.-----	Macrosiphoniella sanborni (Gill.)
Chrysanthemum gall midge a.n.o.-----	Diarthronomyia hypogaea (Loew)
Chrysanthemum lacebug-----	Corythucha marmorata (Uhl.)
Citrus mealybug a.n.o.-----	Pseudococcus citri (Risso)
Citrus red mite a.n.o.-----	Paratetranychus citri McG.
Citrus rust mite a.n.o.-----	Phyllocoptes oleivorus Ashm.
Citrus thrips a.n.o.-----	Scirtothrips citri (Moult.)
Citrus whitefly a.n.o.-----	Dialeurodes citri (Ashm.)
Clear Lake gnat-----	Chaoborus lacustris Freeborn
Clover aphid a.n.o.-----	Anuraphis bakeri (Cowen)
Clover hay worm a.n.o.-----	Hypsopygia costalis (F.)
Clover head weevil a.n.o.-----	Tychius griseus Schaeffer
Clover leaf weevil a.n.o.-----	Hypera punctata (F.)
Clover mite a.n.o.-----	Bryobia practiosa Koch
Clover root borer a.n.o.-----	Hylastinus obscurus (Marshall)
Clover seed chalcid a.n.o.-----	Bruchophagus gibbus (Boh.)
Clover seed midge a.n.o.-----	Dasyneura leguminicola (Lint.)
Coast tent caterpillar-----	Malacosoma pluvialis (Dyar)
Codling moth a.n.o.-----	Carpocapsa pomonella (L.)
Coffee-bean weevil a.n.o.-----	Araecerus fasciculatus (Deg.)
Colorado potato beetle a.n.o.-----	Leptinotarsa decemlineata (Say)
Columbine borer a.n.o.-----	Papaipema purpurifascia (G. & R.)
Columbine leaf miner a.n.o.-----	Phytomyza minuscula Gour.
Common powder-post beetle-----	Lyctus planicollis Lec.
Common red spider a.n.o.-----	Tetranychus telarius (L.)
Constock's mealybug a.n.o.-----	Pseudococcus constocki (Kuw.)
Cooley's spruce gall-----	Adelges cooleyi (Gill.)
Corn ear worm a.n.o.-----	Heliothis armigera (Hbn.)
Corn flea beetle a.n.o.-----	Chaetocnema pulicaria Melsh.
Corn lanternfly-----	Peregrinus maidis (Ashm.)
Corn leaf aphid a.n.o.-----	Aphis maidis Fitch
Corn rootworm a.n.o.-----	Diabrotica longicornis (Say)
Corn root webworm a.n.o.-----	Crambus caliginosellus Clem.
Corn sap beetle a.n.o.-----	Carpophilus dimidiatus (F.)
Corn silk beetle a.n.o.-----	Luperodes brunneus Crotch
Cotton flea hopper a.n.o.-----	Psallus seriatus (Reut.)
Cotton leaf perforator a.n.o.-----	Bucculatrix thurberiella Busck
Cotton leaf worm a.n.o.-----	Alabama argillacea (Hbn.)
Cotton stainer a.n.o.-----	Dysdercus suturalis (H. S.)
Cottonwood leaf beetle a.n.o.-----	Chrysomela scripta F.
Cottonwood scale-----	Chionaspis ortholobis Const.
Cottony-cushion scale a.n.o.-----	Icerya purchasi Mask.
Cottony maple scale a.n.o.-----	Pulvinaria vitis (L.)
Coulee cricket a.n.o.-----	Peranebrus scabricollis (Thos.)
Cowpea curculio a.n.o.-----	Chalcodermus aeneus Boh.
Crab louse a.n.o.-----	Phthirus pubis (L.)
Crapemyrtle aphid a.n.o.-----	Myzocallis kahawaluokalani Kirk.
Currant fruitfly a.n.o.-----	Epochra canadensis Loew
Cyclamen mite a.n.o.-----	Tarsonemus pallidus Banks
Deodar weevil a.n.o.-----	Pissodes nemorensis Germ.
Diamondback moth a.n.o.-----	Plutella maculipennis (Curt.)
Dog flea a.n.o.-----	Ctenocephalides canis (Curt.)



Dogwood club gall-----	<i>Mycodiplosis alternata</i> Felt
Douglas-fir beetle a.n.o.-----	<i>Dendroctonus pseudotsugae</i> Hopk.
Dried fruit beetle a.n.o.-----	<i>Carpophilus hemipterus</i> (L.)
Drug store weevil a.n.o.-----	<i>Stegobium paniceum</i> (L.)
Ear tick a.n.o.-----	<i>Ornithodoros meguini</i> Duges
Eastern spruce gall aphid a.n.o.-----	<i>Adelges abietis</i> (L.)
Eastern tent caterpillar a.n.o.-----	<i>Malacosoma americana</i> (F.)
Eggplant lacebug a.n.o.-----	<i>Gargaphia solani</i> Heid.
Eight-spotted forester a.n.o.-----	<i>Alypia octomaculata</i> (F.)
Elm cockscomb gall a.n.o.-----	<i>Colopha ulmicola</i> (Fitch)
Elm flea beetle-----	<i>Altica ulmi</i> (Woods)
Elm leaf beetle a.n.o.-----	<i>Galerucella xanthomelaena</i> (Schr.)
Elm leaf miner a.n.o.-----	<i>Fenusa ulmi</i> Sund.
Elm sawfly a.n.o.-----	<i>Cimbex americana</i> Leach
Elm scurfy scale a.n.o.-----	<i>Chionaspis americana</i> Johns.
Elm spanworm a.n.o.-----	<i>Ennomos subsignarius</i> (Hbn.)
English grain aphid a.n.o.-----	<i>Macrosiphum granarium</i> (Kby.)
Euonymus scale a.n.o.-----	<i>Chionaspis euonymi</i> Comst.
European chicken flea a.n.o.-----	<i>Coratophyllus gallinae</i> Schr.
European corn borer a.n.o.-----	<i>Pyrausta nubilalis</i> (Hbn.)
European earwig a.n.o.-----	<i>Forficula auricularia</i> L.
European elm scale a.n.o.-----	<i>Gossyparia spuria</i> (Mod.)
European fruit lecanium a.n.o.-----	<i>Lecanium corni</i> Bouche
European pine shoot moth a.n.o.-----	<i>Rhyacionia buoliana</i> (Schiff.)
European red mite a.n.o.-----	<i>Paratetranychus pilosus</i> (C. & F.)
European spruce sawfly a.n.o.-----	<i>Diprion polytomum</i> (Htg.)
European wheat stem sawfly a.n.o.-----	<i>Cephus pygmaeus</i> (L.)
European willow leaf beetle-----	<i>Plagiodera versicolora</i> (Laich.)
Eye-spotted budmoth a.n.o.-----	<i>Spilonota ocellana</i> (D. & S.)
Fall armyworm a.n.o.-----	<i>Laphygma frugiperda</i> (A. & S.)
Fall cankerworm a.n.o.-----	<i>Alsophila pometaria</i> (Harr.)
Fall webworm a.n.o.-----	<i>Hyphantria cunea</i> (Drury)
False chinch bug a.n.o.-----	<i>Nysius ericae</i> (Schill.)
False cottony maple scale-----	<i>Pulvinaria acericola</i> Walsh & Riley
Fern scale a.n.o.-----	<i>Pinnaspis aspidistrae</i> (Sign.)
Fickle midge-----	<i>Sciara inconstans</i> Fitch
Field cricket a.n.o.-----	<i>Gryllus assimilis</i> F.
Fig scale a.n.o.-----	<i>Lepidosaphes ficus</i> (Sign.)
Fir flatheaded borer a.n.o.-----	<i>Melanophila fulvoguttata drummondi</i> (Kby.)
Flatheaded apple tree borer a.n.o.-----	<i>Chrysobothris femorata</i> (Oliv.)
Florida red scale a.n.o.-----	<i>Chrysomphalus aonidum</i> (L.)
Flower thrips a.n.o.-----	<i>Frankliniella tritici</i> (Fitch)
Forest tent caterpillar a.n.o.-----	<i>Malacosoma disstria</i> Hbn.
Fowl tick a.n.o.-----	<i>Argas miniatus</i> Koch
Fruit tree leaf roller a.n.o.-----	<i>Cacoecia argyrospila</i> (Walk.)
Fuller's rose beetle a.n.o.-----	<i>Pantomorus godmani</i> (Crotch)
Garden centipede a.n.o.-----	<i>Scutigera immaculata</i> (Newp.)
Garden flea hopper a.n.o.-----	<i>Halticus citri</i> (Ashm.)
Garden webworm a.n.o.-----	<i>Loxostege similalis</i> (Guen.)

German cockroach a.n.o.-----	<i>Blattella germanica</i> (L.)
Giant hornet a.n.o.-----	<i>Vespa crabro</i> L.
Gladiolus thrips a.n.o.-----	<i>Taeniothrips simplex</i> (Morison)
Goldenglow aphid a.n.o.-----	<i>Macrosiphum rudbeckiae</i> (Fitch)
Gooseberry fruitworm a.n.o.-----	<i>Zophodia convolutella</i> (Hbn.)
Grape berry moth a.n.o.-----	<i>Polychrosis viteana</i> (Clem.)
Grape colaspis a.n.o.-----	<i>Colaspis brunnea</i> (F.)
Grape flea beetle a.n.o.-----	<i>Altica chalybea</i> Ill.
Grape leaf folder a.n.o.-----	<i>Desmia funeralis</i> (Hbn.)
Grape leafhopper a.n.o.-----	<i>Erythroneura comes</i> (Say)
Grape leaf skeletonizer a.n.o.-----	<i>Harrisina americana</i> (Guer.)
Grape phylloxera a.n.o.-----	<i>Phylloxera vitifoliae</i> (Fitch)
Grape plume moth a.n.o.-----	<i>Pterophorus periscolidactylus</i> Fitch
Grape root borer a.n.o.-----	<i>Paranthrene polistiformis</i> (Harr.)
Grape rootworm a.n.o.-----	<i>Fidia viticida</i> Walsh
Grape sawfly a.n.o.-----	<i>Erythrastides pygmaea</i> (Say)
Grape thrips-----	<i>Drepanothrips reuteri</i> Uzel
Grape trunk borer-----	<i>Clytoleptus albofasciatus</i> (Lap.)
Grapevine aphid a.n.o.-----	<i>Aphis illinoisensis</i> Shin.
Grass thrips a.n.o.-----	<i>Anaphothrips obscurus</i> (Mull.)
Great Basin tent caterpillar-----	<i>Malacosoma fragilis</i> (Stretch)
Green bug a.n.o.-----	<i>Toxoptera graminum</i> Rond.
Green citrus aphid-----	<i>Aphis spiraeicola</i> Patch
Green clover worm a.n.o.-----	<i>Plathypena scabra</i> (F.)
Green June beetle a.n.o.-----	<i>Cotinis nitida</i> (L.)
Green peach aphid a.n.o.-----	<i>Myzus persicae</i> (Sulz.)
Green stinkbug a.n.o.-----	<i>Acrosternum hilare</i> (Say)
Greenhouse leaf tier a.n.o.-----	<i>Phlyctaenia rubigalis</i> (Guen.)
Greenhouse stone cricket a.n.o.-----	<i>Tachycines asynamorus</i> Adel.
Greenhouse whitefly a.n.o.-----	<i>Trialeurodes vaporariorum</i> (Westw.)
Green-striped maple worm a.n.o.-----	<i>Anisota rubicunda</i> F.
Gulf coast tick a.n.o.-----	<i>Amblyomma maculatum</i> Koch
Gypsy moth a.n.o.-----	<i>Porthetria dispar</i> (L.)
Hackberry nipple gall a.n.o.-----	<i>Pachypsylla celtidis-nanma</i> Riley
Hairy chinch bug a.n.o.-----	<i>Blissus hirtus</i> Montd.
Harlequin bug a.n.o.-----	<i>Murgantia histrionica</i> (Hahn)
Hawaiian beet webworm a.n.o.-----	<i>Hymenia fascialis</i> (Cran.)
Hawthorne leaf miner-----	<i>Proconusa canadensis</i> (Marlatt)
Hemlock borer a.n.o.-----	<i>Melanophila fulvoguttata</i> (Harr.)
Hessian fly a.n.o.-----	<i>Phytophaga destructor</i> (Say)
Hickory bark beetle a.n.o.-----	<i>Scolytus quadrispinosus</i> Say
Hickory leaf stem gall-----	<i>Phylloxera caryaecaulis</i> Fitch
Hickory phylloxera-----	<i>Phylloxera caryaecaulis</i> Fitch
Hickory shuck worm a.n.o.-----	<i>Laspeyresia caryana</i> (Fitch)
Hickory tussock moth a.n.o.-----	<i>Halisidota caryae</i> (Harr.)
Hog louse a.n.o.-----	<i>Haematopinus suis</i> (L.) (Changed to <i>Haematopinus adventicius</i> Neum.)
Holly leaf miner a.n.o.-----	<i>Phytomyza ilicis</i> Curt.
Hop aphid a.n.o.-----	<i>Phorodon humuli</i> (Schr.)
Horn fly a.n.o.-----	<i>Haematobia irritans</i> L.
Horned oak gall-----	<i>Andricus cornigerus</i> O.S.



House centipede a.n.o.-----	<i>Scutigera forceps</i> Raf.
House cricket a.n.o.-----	<i>Gryllus domesticus</i> L.
Howard's scale a.n.o.-----	<i>Aspidiotus howardi</i> Ckll.
Imbricated snout beetle a.n.o.-----	<i>Epicaerus imbricatus</i> (Say)
Imported cabbage worm a.n.o.-----	<i>Pieris rapae</i> (L.)
Imported currant worm a.n.o.-----	<i>Pteronidea ribesii</i> (Scop.)
Imported willow leaf beetle-----	<i>Plagiodera versicolora</i> (Laich.)
Indian-meal moth a.n.o.-----	<i>Plodia interpunctella</i> (Hbn.)
Introduced pine sawfly a.n.o.-----	<i>Diprion simile</i> (Htg.)
Iris borer a.n.o.-----	<i>Macronoctua onusta</i> Grote
Japanese beetle a.n.o.-----	<i>Popillia japonica</i> Newm.
Japanese maple scale-----	<i>Leucaspis japonica</i> Ckll.
Juniper scale-----	<i>Diaspis carueli</i> Targ.
Juniper webworm-----	<i>Dichomeris marginellus</i> F.
Larch casebearer a.n.o.-----	<i>Coleophora laricella</i> Hbn.
Larch sawfly a.n.o.-----	<i>Lygaeonematus erichsonii</i> (Htg.)
Larger canna leaf roller a.n.o.-----	<i>Calpodes ethlius</i> (Cram.)
Larger elm leaf beetle-----	<i>Monocosta coryli</i> (Say)
Lead cable borer a.n.o.-----	<i>Scobicia declivis</i> (Lec.)
Leaf crumpler a.n.o.-----	<i>Mineola indigenella</i> (Zell.)
Leaf-footed bug a.n.o.-----	<i>Leptoglossus phyllopus</i> (L.)
Lesser apple worm a.n.o.-----	<i>Grapholitha prunivora</i> (Walsh)
Lesser cornstalk borer a.n.o.-----	<i>Elasmopalpus lignosellus</i> (Zell.)
Lesser peach borer a.n.o.-----	<i>Conopia pictipes</i> (G. & R.)
Lilac borer a.n.o.-----	<i>Podosesia syringae</i> (Harr.)
Lima bean vine borer a.n.o.-----	<i>Monoptilota pergratialis</i> (Hulst)
Linden bark borer-----	<i>Chrysoclista linneella</i> Glerck
Linden borer a.n.o.-----	<i>Saperda vestita</i> Say
Linden wart gall-----	<i>Cecidomyia verrucicola</i> O.S.
Locust borer a.n.o.-----	<i>Cyllene robiniae</i> (Forst.)
Locust leaf miner a.n.o.-----	<i>Chalepus dorsalis</i> Trunb.
Lone star tick a.n.o.-----	<i>Amblyomma americanum</i> (L.)
Long-nosed cattle louse-----	<i>Linognathus vituli</i> L.
Magnolia scale a.n.o.-----	<i>Neolecanium cornuparvum</i> (Thro)
Maple bladder gall-----	<i>Phyllocoptes quadripes</i> Shim.
Maple leaf cutter a.n.o.-----	<i>Paraclemensia acerifoliella</i> (Fitch)
Maple leaf stem borer-----	<i>Caulacampus acericaulis</i> MacG. (Changed to <i>Priophorus acericaulis</i> (MacG.))
Meadow plant bug a.n.o.-----	<i>Miris dolabratus</i> (L.)
Mealy flate-----	<i>Ormenis pruinosa</i> (Say)
Mealy plum aphid a.n.o.-----	<i>Hyalopterus arundinis</i> (F.)
Melon aphid a.n.o.-----	<i>Aphis gossypii</i> Glov.
Mexican bean beetle a.n.o.-----	<i>Epilachna varivestis</i> Muls.
Mexican fruitfly a.n.o.-----	<i>Anastrepha ludens</i> (Loew)
Mint flea beetle-----	<i>Longitarsus waterhousei</i> Kutsch.
Monarch butterfly a.n.o.-----	<i>Danaus menippe</i> (Hbn.)
Mormon cricket a.n.o.-----	<i>Anabrus simplex</i> Hald.



Mossy rose gall a.n.o.-----  
Mourning-cloak butterfly a.n.o.-----  
Mulberry whitefly a.n.o.-----

Native elm bark beetle a.n.o.-----  
Negro bug a.n.o.-----  
New York weevil a.n.o.-----  
Northern cattle grub a.n.o.-----  
Northern mole cricket a.n.o.-----  
Norway maple aphid a.n.o.-----  
Nose botfly a.n.o.-----

Oak button gall-----  
Oak lacebug-----  
Oblong weevil-----  
Obscure scale a.n.o.-----  
Oleander scale a.n.o.-----  
Olive scale-----  
Onion maggot a.n.o.-----  
Onion plant bug-----  
Onion thrips a.n.o.-----  
Orange-striped oak worm a.n.o.-----  
Oriental beetle a.n.o.-----  
Oriental cockroach a.n.o.-----  
Oriental fruit moth a.n.o.-----  
Oriental rat flea a.n.o.-----  
Oystershell scale a.n.o.-----

Pacific coast tick a.n.o.-----  
Pacific grass bug-----  
Pacific mite-----  
Pale western cutworm a.n.o.-----

Pandora moth a.n.o.-----  
Papaya fruitfly a.n.o.-----  
Papaya webworm-----  
Pea aphid a.n.o.-----  
Pea weevil a.n.o.-----  
Peach borer a.n.o.-----  
Peach twig borer a.n.o.-----  
Pear leaf blister mite a.n.o.-----  
Pear leaf rolling midge-----  
Pear psylla a.n.o.-----  
Pear slug a.n.o.-----  
Pear thrips a.n.o.-----  
Pecan carpenter worm a.n.o.-----  
Pecan leaf casebearer a.n.o.-----  
Pecan nut casebearer a.n.o.-----  
Pecan phylloxera a.n.o.-----  
Pecan weevil a.n.o.-----  
Pepper maggot-----  
Pepper weevil a.n.o.-----  
Periodical cicada a.n.o.-----

*Rhodites rosae* (L.)  
*Hanadryas antiopa* (L.)  
*Tetraneura mori* (Quaint.)  
*Hylurgopinus rufipes* (Eich.)  
*Allocoris pulicaria* (Germ.)  
*Ithycerus noveboracensis* (Forst.)  
*Hypoderma bovis* (Deg.)  
*Gryllotalpa hexadactyla* Perty  
*Periphyllus lyropictus* (Kess.)  
*Gasterophilus haemorrhoidalis* (L.)

*Neuroterus umbilicatus* Bass.  
*Corythucha ciliata* (Say)  
*Phyllobius oblongus* L.  
*Chrysomphalus obscurus* (Const.)  
*Aspidiotus noderae* (Vallot)  
*Parlatoria oleae* Colv.  
*Hylemya antiqua* (Meig.)  
*Labopidea allii* Knight  
*Thrips tabaci* Lind.  
*Anisota senatoria* (A. & S.)  
*Anonala orientalis* Wthr.  
*Blatta orientalis* L.  
*Grapholitha molesta* (Busck)  
*Xenopsylla cheopis* (Rothsch.)  
*Lepidosaphes ulmi* (L.)

*Dermacentor occidentalis* Neun.  
*Thyridius pacificus* (Uhl.)  
*Tetranychus pacificus* McG.  
*Porosagrotis orthogonia* (Morr.)  
(Changed to *Agrotis orthogonia* Morr.)  
*Coloradia pandora* Blake  
*Toxotrypana curvicauda* Gerst.  
*Homalopaltia dalera* Dyar  
*Macrosiphum pisi* (Kltb.)  
*Bruchus pisorum* (L.)  
*Conopia exitiosa* (Say)  
*Anarsia lineatella* Zell.  
*Eriophyes pyri* Pgst.  
*Dasyneura pyri* (Boucho)  
*Psylla pyricola* (Foerst.)  
*Caliroa cerasi* (L.)  
*Tecniothrips inconsequens* (Uzel)  
*Cossula magnifica* (Stkr.)  
*Acrobasis juglandis* (LoB.)  
*Acrobasis caryae* Grote  
*Phylloxera devastatrix* Perg.  
*Curculio caryae* (Horn)  
*Zonosemata electa* (Say)  
*Anthonomus eugenii* Cano  
*Magdalenicada septendecim* (L.)

Phlox plant bug-----  
 Pickleworm a.n.o.-----  
 Pigeon tremex a.n.o.-----  
 Pine bark aphid a.n.o.-----  
 Pine needle scale a.n.o.-----  
 Pineapple mealybug a.n.o.-----  
 Pink bollworm a.n.o.-----  
 Pistol casebearer a.n.o.-----  
 Pitch twig moth a.n.o.-----  
 Plains false wireworm a.n.o.-----  
 Plum curculio a.n.o.-----  
 Plum gouger a.n.o.-----  
 Plum leafhopper a.n.o.-----  
 Polka-dot wasp moth-----  
 Poplar and willow borer a.n.o.-----  
 Poplar tent maker-----  
 Poplar ya abond aphid a.n.o.-----  
 Potato aphid a.n.o.-----  
 Potato flea beetle a.n.o.-----  
 Potato leafhopper a.n.o.-----  
 Potato psyllid-----  
 Potato stalk borer a.n.o.-----  
 Potato tuber worm a.n.o.-----  
 Prometheus moth a.n.o.-----  
 Pubescent oak kermes-----  
 Purple scale a.n.o.-----  
 Putnam's scale a.n.o.-----  
 Pyriform scale a.n.o.-----

Rabbit tick a.n.o.-----  
 Raisin moth a.n.o.-----  
 Raspberry cane borer a.n.o.-----  
 Raspberry fruitworm a.n.o.-----  
 Raspberry root borer a.n.o.-----  
 Raspberry sawfly a.n.o.-----  
 Red-backed cutworm a.n.o.-----  
 Red elm bark weevil a.n.o.-----  
 Red-headed pine sawfly a.n.o.-----  
 Red-humped caterpillar a.n.o.-----  
 Red-legged flea beetle a.n.o.-----  
 Red-necked cane borer a.n.o.-----  
 Red-necked flea beetle-----  
 Red turnip beetle a.n.o.-----  
 Rhinoceros beetle-----  
 Rhododendron borer-----  
 Rhododendron lacebug a.n.o.-----  
 Rhubarb curculio a.n.o.-----  
 Rice stalk borer a.n.o.-----  
 Rocky Mountain spotted fever tick-----  
 Rose aphid a.n.o.-----  
 Rose chafer a.n.o.-----  
 Rose curculio a.n.o.-----

Lopidea davisii Knight  
 Diaphania nitidalis (Stoll)  
 Tremex columba (L.)  
 Pineus strobi (Htg.)  
 Chionaspis pinifoliae (Fitch)  
 Pseudococcus brevipes (Ckll.)  
 Pectinophora gossypiella (Saund.)  
 Coleophora malivorella Riley  
 Petrova comstockiana (Fern.)  
 Elcodes opaca (Say)  
 Conotrachelus nenuphar (Hbst.)  
 Anthonomus scutellaris Lec.  
 Macropsis trinaculata (Fitch)  
 Syntomeida epilais Walk.  
 Sternochetus lapathi (L.)  
 Ichthyura inclusa Hbn.  
 Mordwilkoja vagabunda (Walsh)  
 Macrosiphum solanifolii (Ashm.)  
 Epitrix cucumeris (Harr.)  
 Empoasca fabae (Harr.)  
 Paratrioza cockerelli (Sulc)  
 Trichobaris trinotata (Say)  
 Gnorimoschema operculella (Zell.)  
 Callosamia promethea (Drury)  
 Kermes pubescens Bogue  
 Lepidosaphes beekii (Newm.)  
 Aspidiotus ancylus (Putn.)  
 Protopulvinaria pyriformis (Ckll.)

Haemaphysalis leporis-palustris Pacl  
 Ephestia figulilella Greg.  
 Oberca bimaculata (Oliv.)  
 Byturus unicolor Say  
 Bembocia marginata (Harr.)  
 Monophadnoides rubi (Harr.)  
 Euxoa ochrogaster (Guen.)  
 Magdalis armicollis (Say)  
 Neodiprion lecontei (Fitch)  
 Schizura concinna (A. & S.)  
 Derocrepis erythropus (Melsh.)  
 Agrilus ruficollis (F.)  
 Systema hudsonias (Forst.)  
 Entomoscelis adonidis (Pallas)  
 Dynastes tityus (L.)  
 Conopia rhododendri (Boutm.)  
 Stephanitis rhododendri Horv.  
 Lixus concavus Say  
 Chilo plejadellus Zinck.  
 Dermancenter andersoni Stiles  
 Macrosiphum rosae (L.)  
 Macroductylus subspinosus (F.)  
 Rhymecolus color (F.)



Rose leaf beetle a.n.o.-----  
 Rose midge a.n.o.-----  
 Rose sawfly a.n.o.-----  
 Rosy apple aphid a.n.o.-----  
 Roundheaded apple tree borer a.n.o.-----  
 Rusty plum aphid a.n.o.-----

Saddleback caterpillar a.n.o.-----  
 Salmonfly-----  
 San Jose scale a.n.o.-----  
 Satin moth a.n.o.-----  
 Say's blister beetle a.n.o.-----  
 Say's stinkbug a.n.o.-----  
 Scallop-shell moth-----  
 Scotch pine lecanium-----  
 Screwworm a.n.o.-----  
 Scurfy scale a.n.o.-----  
 Seed-corn beetle a.n.o.-----  
 Seed-corn maggot a.n.o.-----  
 Sheep botfly a.n.o.-----  
 Sheep tick a.n.o.-----  
 Short-nosed cattle louse a.n.o.-----  
 Shot-hole borer a.n.o.-----  
 Silver-spotted skipper-----

Sitka spruce gall aphid-----  
 Six-spotted grape beetle-----  
 Six-spotted leafhopper a.n.o.-----  
 Six-spotted mite a.n.o.-----  
 Small body hen louse-----  
 Smaller European elm bark beetle a.n.o.-----  
 Snowball aphid a.n.o.-----  
 Soft scale a.n.o.-----  
 Sorghum midge a.n.o.-----  
 Sorghum webworm a.n.o.-----  
 Southern corn leaf beetle-----  
 Southern corn rootworm a.n.o.-----  
 Southern cornstalk borer a.n.o.-----  
 Southern green stinkbug a.n.o.-----  
 Southern mole cricket a.n.o.-----  
 Spinach carrion beetle-----  
 Spinach leaf miner a.n.o.-----  
 Spiraea aphid-----  
 Spotted cucumber beetle a.n.o.-----  
 Spotted willow leaf beetle-----  
 Spring cankerworm a.n.o.-----  
 Spruce budworm a.n.o.-----  
 Spruce gall aphid-----  
 Spruce mite-----  
 Spruce needle miner-----  
 Spruce red spider-----  
 Squash beetle a.n.o.-----  
 Squash borer a.n.o.-----

*Nodonota puncticollis* Say  
*Dasyneura rhodophaga* (Coq.)  
*Caliroa aethiops* (F.)  
*Anuraphis roseus* (Baker)  
*Saperda candida* F.  
*Hysteroneura setariae* (Thos.)

*Sibine stimulea* (Clem.)  
*Taeniopteryx pacifica* Banks  
*Aspidiotus perniciosus* Comst.  
*Stilpnotia salicis* (L.)  
*Pomphopoea sayi* (Lec.)  
*Chlorochroa sayi* Stal  
*Calocalpe undulata* L.  
*Toumeyella numismaticum* P. & McD.  
*Cochliomyia americana* C. & P.  
*Chionaspis furfura* (Fitch)  
*Agonoderus lecontei* Chaud.  
*Hylemya cilicrura* (Rond.)  
*Oestris ovis* L.  
*Melophagus ovinus* (L.)  
*Haematopinus eurytetrus* Nitz.  
*Scolytus rugulosus* (Ratz.)  
*Epargyreus tityrus* F. (Changed to  
*Proteides clarus* (Cram.))  
*Adelges cooleyi* (Gill.)  
*Polidnota punctata* (L.)  
*Macrosteles divisus* (Uhl.)  
*Tetranychus sexmaculatus* Riley  
*Monopon pallidum* Nitz.  
*Scolytus multistriatus* Marsham  
*Aphis viburnicola* Gill.  
*Coccus hesperidum* L.  
*Contarinia sorghicola* (Coq.)  
*Celama sorghiella* (Riley)  
*Myochrous denticollis* (Say)  
*Diabrotica duodecimpunctata* (F.)  
*Diatraea crambidoides* (Grote)  
*Nezara viridula* (L.)  
*Scaptiscus acletus* R. & H.  
*Silpha bituberosa* Lec.  
*Pegomya hyoscyami* (Panz.)  
*Aphis spiraeicola* Patch  
*Diabrotica duodecimpunctata* (F.)  
*Chrysomela lapponica* (L.)  
*Palaecrita vernata* (Peck)  
*Cacoccia fumiferana* (Clem.)  
*Pineus pinifoliae* (Fitch)  
*Paratetranychus uniunguis* Jacobi  
*Taniva albolineana* Kearf.  
*Paratetranychus uniunguis* Jacobi  
*Epilachna borealis* (F.)  
*Melittia satyriniformis* Hbn.



Squash bug a.n.o.-----	<i>Anasa tristis</i> (Deg.)
Stablefly a.n.o.-----	<i>Stomoxys calcitrans</i> (L.)
Stalk borer a.n.o.-----	<i>Papaipema nebris nitela</i> (Guen.)
Strawberry crown borer a.n.o.-----	<i>Tyloderma fragariae</i> (Riley)
Strawberry crown moth a.n.o.-----	<i>Conopia bibionipennis</i> (Bdv.)
Strawberry fruitworm a.n.o.-----	<i>Cnephasia longana</i> (Haw.)
Strawberry leaf-chaffer-----	<i>Diplotaxis frondicola</i> Say
Strawberry leaf roller a.n.o.-----	<i>Ancylis comptana</i> (Froel.)
Strawberry pamera-----	<i>Pamera longulus</i> Dall. (Changed to <i>Paromius longulus</i> (Dall.))
Strawberry root aphid a.n.o.-----	<i>Aphis forbesi</i> Wood
Strawberry root weevil a.n.o.-----	<i>Brachyrhinus ovatus</i> (L.)
Strawberry weevil a.n.o.-----	<i>Anthonomus signatus</i> Say
Striped cucumber beetle a.n.o.-----	<i>Diabrotica vittata</i> (F.)
Sucking horse louse a.n.o.-----	<i>Haematopinus asini</i> (L.)
Sugar-beet root aphid a.n.o.-----	<i>Pemphigus betae</i> Doane
Sugar-beet root maggot-----	<i>Tetanops aldrichi</i> Hendel
Sugar-beet wireworm a.n.o.-----	<i>Limonijs californicus</i> (Mann.)
Sugarcane beetle a.n.o.-----	<i>Euotheola rugiceps</i> (Lec.)
Sugarcane borer a.n.o.-----	<i>Diatraea saccharalis</i> (F.)
Sugarcane rootstock weevil-----	<i>Anacentrinus subnudus</i> Buch.
Sunflower weevil-----	<i>Rhodoabaenus tredecimpunctatus</i> (Ill.)
Sweetlover weevil-----	<i>Sitona cylindricollis</i> Fahracus
Sweetpotatoleaf beetle-----	<i>Typophorus viridicyaneus</i> (Crotch)
Sweetpotato weevil a.n.o.-----	<i>Cylas formicarius</i> (F.)
Tarnished plant bug a.n.o.-----	<i>Lygus pratensis oblineatus</i> (Say)
Tea scale-----	<i>Fiorinia theae</i> Green
Tentiform leaf miner-----	<i>Ornix geminatella</i> Pack.
Terrapin scale a.n.o.-----	<i>Lecanium nigrofasciatum</i> Perg.
Three-cornered alfalfa hopper a.n.o.-----	<i>Stictocephala festina</i> (Say)
Three-lined fig borer-----	<i>Ptychodes trilineatus</i> (L.)
Thurberia weevil a.n.o.-----	<i>Anthonomus grandis thurberiae</i> Pierce
Tissue paper bug-----	<i>Thyldrias contractus</i> Mots.
Tobacco budworm a.n.o.-----	<i>Heliothis virescens</i> (F.)
Tobacco flea beetle a.n.o.-----	<i>Epitrix parvula</i> (F.)
Tobacco moth a.n.o.-----	<i>Ephestia elutella</i> (Hbn.)
Tobacco thrips a.n.o.-----	<i>Frankliniella fusca</i> (Hinds)
Tomato pinworm a.n.o.-----	<i>Keiferia lycopersicella</i> (Busck)
Tomato psyllid-----	<i>Paratrioza cockerelli</i> (Sulc)
Tropical rat mite a.n.o.-----	<i>Liponyssus bacoti</i> (Hirst)
Tule beetle a.n.o.-----	<i>Agonum maculicollis</i> (Dej.)
Tuliptree scale a.n.o.-----	<i>Toumeyella liriodendri</i> (Gmel.)
Turnip aphid a.n.o.-----	<i>Rhopalosiphum pseudobrassicae</i> (Davis)
Twig girdler a.n.o.-----	<i>Oncideres cingulatus</i> (Say)
Twig pruner a.n.o.-----	<i>Hypernallus villosus</i> (F.)
Ugly-nest caterpillar a.n.o.-----	<i>Cacoecia cerasivorana</i> (Fitch)
Vegetable weevil a.n.o.-----	<i>Listroderes obliquus</i> Klug
Velvetbean caterpillar a.n.o.-----	<i>Anticarsia gemmatilis</i> (Hbn.)
Vetch bruchid a.n.o.-----	<i>Bruchus brachialis</i> Fahracus
Viceroy a.n.o.-----	<i>Basilarchia archippus</i> (Cram.)

Walnut caterpillar a.n.o.-----	<i>Dotana integerrima</i> G. & R.
Walnut scale a.n.o.-----	<i>Aspidiotus juglans-regiae</i> Comst.
West Indian sugarcane fulgorid-----	<i>Saccharosydne saccharivora</i> Westw.
Wharf borer-----	<i>Nacorda melanura</i> (L.)
Wheat brown mite-----	<i>Tetranychina tritici</i> (Ewing)
Wheat jointworm a.n.o.-----	<i>Harmolita tritici</i> (Fitch)
Wheat midge a.n.o.-----	<i>Thecodiplosis mosollana</i> Gehin
Wheat stem maggot a.n.o.-----	<i>Meromyza americana</i> Fitch
Wheat stem sawfly a.n.o.-----	<i>Cephus cinctus</i> Nort.
Wheat straw worm a.n.o.-----	<i>Harmolita grandis</i> (Riley)
Wheat white grub-----	<i>Phyllophaga lanceolata</i> (Say)
White-fringed beetle a.n.o.-----	<i>Naupactus leucoloma</i> Boh. (Changed to <i>Pantomorus leucoloma</i> (Boh.))
White-lined sphinx a.n.o.-----	<i>Sphinx lineata</i> F.
White peach scale a.n.o.-----	<i>Aulacaspis pentagona</i> (Targ.)
White-pine weevil a.n.o.-----	<i>Pissodes strobi</i> (Peck)
Willow-grove aphid-----	<i>Melanoxantherium smithiae</i> (Monell)
Willow grove plant louse-----	<i>Melanoxantherium smithiae</i> (Monell)
Woolly alder aphid a.n.o.-----	<i>Prociphilus tessellatus</i> (Fitch)
Woolly apple aphid a.n.o.-----	<i>Eriosoma lanigerum</i> (Hausm.)
Woolly elm aphid a.n.o.-----	<i>Eriosoma americanum</i> (Riley)
Woolly larch aphid-----	<i>Chermes strobilobius</i> Kltb.
Yellow-necked caterpillar a.n.o.-----	<i>Datana ministra</i> (Drury)
Yellow scale-----	<i>Chrysomphalus citrinus</i> (Coq.)
Yellow-striped armyworm a.n.o.-----	<i>Prodenia ornithogalli</i> Guen.
Yellow sugarcane aphid-----	<i>Sipha flava</i> Forbes





















